



AGRICULTURAL RESEARCH INSTITUTE

PUSA

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A TICK WILL

get to your Cattle
through any Fence.
Take him in time.
Rub your Beasts well
with Tick Grease.
Cooper's Non-Pois-
onous Cattle Tick
Grease. Rub it well
in the Ears and under
the Tail—it does not
scald the Cattle, and
... you will ...

LAUGH AT

the Tick. Make
Cooper's Cattle Dip
do the rest—the Dip
that kills the Ticks.
Be a constant user
of this famous Dip,
and in spite of East
Coast Fever all
round, you will pre-
serve your Cattle
... within ...

YOUR FENCE

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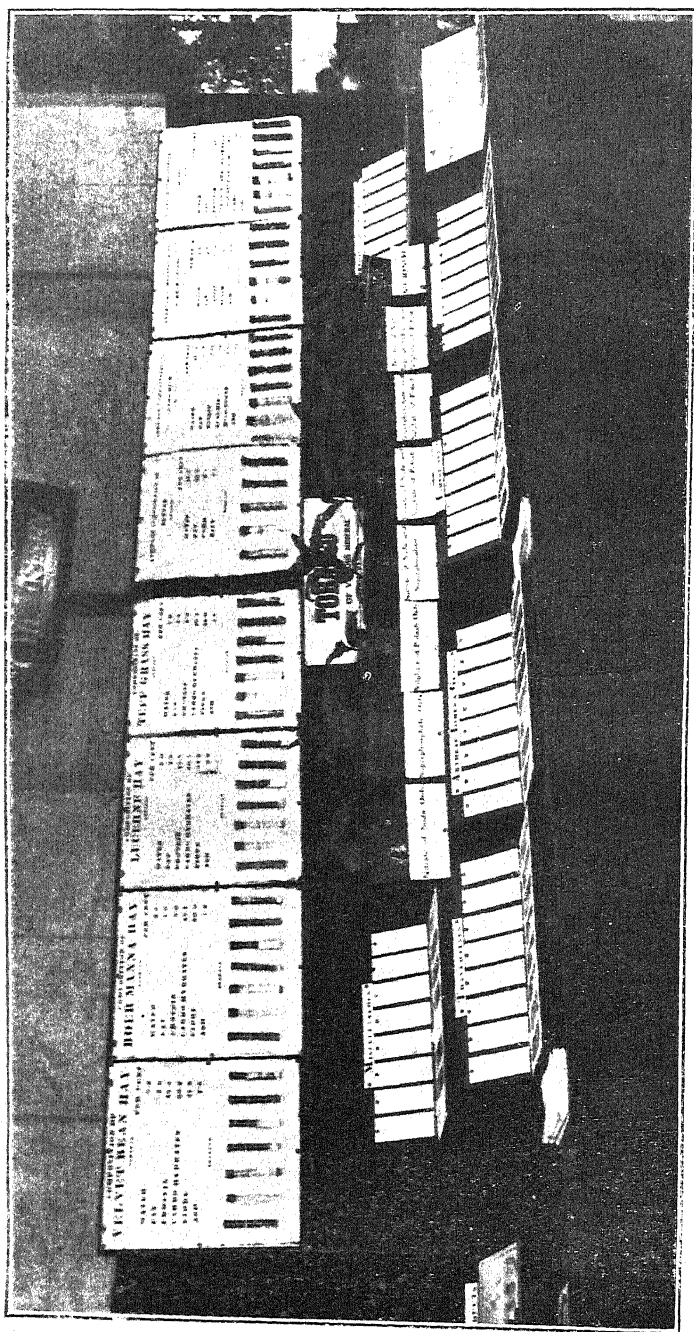
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THE RHODESIA
AGRICULTURAL JOURNAL.

*Edited by the Director of Agriculture
assisted by the Staff of the Agricultural Department.*

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Editorial.

LAND BANKS AND AGRICULTURAL CREDIT.—As will be seen from the article on Agricultural Credit Associations, which appears in the present issue from the pen of Professor Loudon M. Douglas, F.R.S.E., this method of supplying capital for agricultural purposes offers many opportunities to the farmers of Rhodesia, which it is hoped they may see their way to quickly take advantage of.

There is no doubt that the lack of capital is one of the chief reasons why more land is not broken to arable purposes on many of the large farms throughout the country, and why better class stock, and in particular better bred sires are not more commonly met with.

Agricultural Credit, as is explained in the present issue, is a distinctive form of banking which may be described as Co-operative Credit, and involves the formation of separate associations, the members of which must be severally and collectively responsible for any loans sanctioned by the Association to its members.

So far as Rhodesia is concerned, this is quite a new idea, but the principle has been in existence in Europe for more than half a century and, from very small beginnings, has developed into one of the principle features of European agriculture. The same principle has extended also to British Colonies and countries in the Far East, and from the records available, it would seem to be the case that in none of these countries have there been any losses by failure to meet obligations, or otherwise.

There is certainly a necessity for discussion on this subject in Rhodesia, and it would be well if the various Farmers' Associations would at once take the matter up, and examine the scheme closely, so that if it is found advisable, they might take advantage of it, and using their own Associations as a nucleus, it might be possible to form Agricultural Credit Associations without much delay.

In this way much needed capital could be obtained, and applied to the purchase of breeding stock, draught animals, fertilizers, and in the general development of the agricultural and pastoral industries of the country.

There is a great difference between agricultural credit and the system of loans which may be derived from a Land Bank. The agricultural credit system is one of mutual responsibility and personal repute, whereas direct loans to farmers from Land Banks are only granted on tangible security. This system has been called into existence in the Transvaal, and, so far, has worked very well, but it is quite obvious that the granting of a loan on mortgage is a totally different matter from a loan obtained by a member of an Agricultural Credit Association, on personal security.

In Natal a somewhat analogous system exists, whereby loans may be granted to settlers who do not actually own the farms, but in that case also tangible security has to be forthcoming, and the loans are usually made on the permanent improvements which the settler has actually carried out.

At some of the discussions which have occurred at the various meetings held by Professor L. M. Douglas, questions have arisen with regard to the possibility of forming Agricultural Credit Associations, and it would appear that there is considerable misunderstanding as to what these Associations are

really meant to accomplish. It is hoped that the publication of the fullest possible details will remove from the minds of farmers any idea that these Associations are suggested for any other purpose than their mutual welfare.

As has been said the matter is one which deserves the fullest possible enquiry and discussion amongst the various Farmers' Associations, in order that the settlers of Rhodesia may satisfy themselves whether this method of financial assistance is acceptable or not.

NATIVE LABOUR.—At the time of writing, the great problem before the country is the question of the native labour supply, and it is safe to say that never in the history of South Africa has any territory been faced with a more acute labour crisis than is Southern Rhodesia to-day. For months past, scarcity of labour has been making its unwelcome presence felt, and the serious nature of the situation has become particularly evident during the present reaping season.

In several districts lack of labour has been so great that farmers have been, and still remain, entirely without boys for reaping their crops, and in more than one instance, it has been necessary to have the crop reaped by contract at a price which practically precludes all chance of profit to the farmer. Building and other permanent improvements on farms is virtually at a standstill, and even the threshing of small seed, such as beans and Boer manna, has in many cases been abandoned. The shortage of labour exists principally in Mashonaland, where, owing to the greater amount of agriculture practised, larger supplies of labour are required. The Native Commissioners of Matabeleland state that in ten districts supplies of labour are equal to the demand and in only two districts is the supply inadequate.

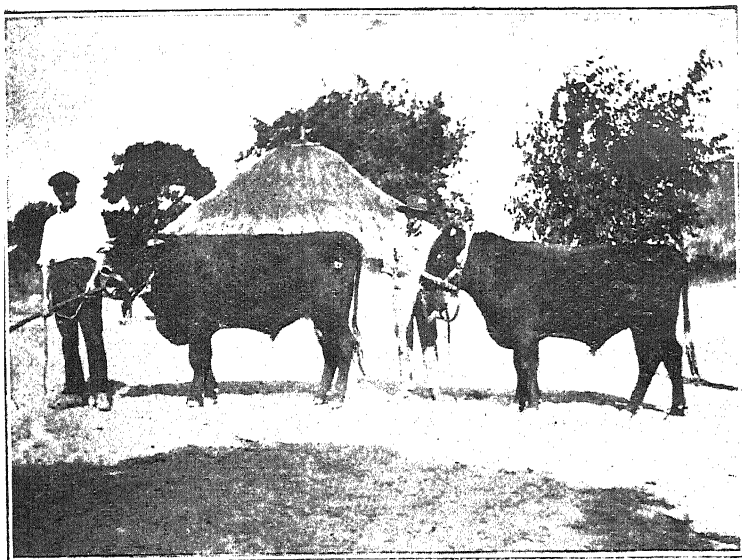
In Mashonaland several Farmers' Associations have despatched their own labour agents in order, if possible, to recruit natives, but it is certain that unless labour is forthcoming within the next month the area planted to maize, tobacco and other crops will show a great falling off, which will be accompanied by a rise in the price of grain. For want of labour the reaping season was delayed some weeks, and already on nearly all farms the ploughing is seriously behind-hand.

The report of the management and Finance Committee of the Rhodesia Native Labour Bureau for the months of June and July shews a great decrease in the number of boys the bureau were able to supply. In one district of Mashonaland, during the months of May, June and July of 1911, only some sixty indigenous natives took out passes to seek work as against over two hundred who took out passes during a similar period in 1910. The failure of the Bureau to obtain labour is largely attributable to the action of the Nyasaland Government, but not entirely so, since the supply from North Western Rhodesia and from the Victoria district also shews a marked decrease.

As most readers of the JOURNAL will be aware, the deputation of Rhodesian delegates, who recently waited upon His Excellency the Governor of Nyasaland, returned from what might appear a fruitless mission, and the reply which they received leaves little doubt that, whatever the final outcome may be, the recruiting of native labour in Nyasaland for the benefit of Rhodesia will receive but little sympathy from the planters and farmers of that territory. His Excellency the Governor pointed out that Nyasaland also was suffering from a shortage of labour, and to whatever causes this may be due, it is not therefore surprising that outside recruiting is discountenanced. It was stated quite frankly that what legitimate steps the Nyasaland Government could take to prevent the exodus of her natives would be taken.

His Excellency the High Commissioner, when waited upon in Salisbury by a deputation of labour employers promised that the fullest enquiries would be made into the matter, and it remains to be seen whether the natives of Nyasaland will not elect to dispose of their services in the higher paid markets of the southern territories. Should it be decided that Nyasaland is in the right in taking steps to discourage the exodus of her natives, then it would also appear admissible to bring greater pressure to bear on our own natives in order to bring them into the labour market more frequently. There seems little doubt that the Mashona is rapidly acquiring greater wealth, and though his tastes may be becoming more extravagant his means are keeping pace.

A mass meeting of farmers is to be held in Salisbury on the 21st of September, at which representatives of the various



Shorthorn Bulls imported by the Department of Agriculture. Bred by Mr. J. T. Hobbs. "Baronet" (left) and "Favourite Pride"



Hereford Bulls imported by the Department of Agriculture. Bred by His Majesty the King. "Dauntless" (left) and "Peerless."

the appearance of two articles on swine husbandry by local farmers, namely, Mr. T. M. Rixon, of Insiza, and Mr. H. Biffen, of Umvuma, and we take this opportunity of again reminding our readers that articles or correspondence dealing with farming practice in Rhodesia will always be welcome.

MR. E. M. JARVIS.—It is with regret that we have to record the resignation of Mr. E. M. Jarvis, F.R.C.V.S., from his position as Government Veterinary Surgeon. Mr. Jarvis's connection with the Veterinary Department of Southern Rhodesia dates back for ten years, during which time he has twice filled the position of Acting Chief Veterinary Surgeon. In his capacity of Government Veterinary Surgeon of the Umtali district Mr. Jarvis gained the confidence of the entire farming public, and his resignation is a loss not only to the Department but to the farmers of Rhodesia.

Mr. C. R. Edmonds, M.R.C.V.S., Government Veterinary Surgeon, Bulawayo, assumes the post of Acting Chief Veterinary Surgeon during the absence on leave of Mr. J. M. Sinclair.

RHODESIAN WOOL.—Through the courtesy of Mr. N. N. Rutherford, of North Melsetter, and Mr. J. Meikle, of Umtali, we are enabled to publish a sales account of certain Melsetter grown Merino wool which has recently been marketed. The top price realised for 1st combing, ten months' growth fleece, was 9½d. per lb.—a figure with which the breeders have every reason to be satisfied. The average price for the consignment was about 7d. per lb. and the lowest 4½d. and 4¾d. per lb. for "mixed" and locks respectively.

Certain parts of the Melsetter district are eminently well suited to Merino sheep, and the prices realised bear evidence of the quality of the wool.

The most recent statistics available place the number of Merino sheep in the Melsetter district at somewhere between two and three thousand, while it is estimated there are fully 400,000 acres of sheep veld in the district. With better flock management and the introduction of high class rams, the Merino wool industry should become of primary importance to the northern part of the district.

OESTRUS-OVIS IN SHEEP.—Breeders of sheep in Rhodesia will read with interest Mr. Alec King's short article on

œstrus-ovis. It is frequently reported by farmers owning sheep that the latter die off from what appears to be intestinal worms, but that dosing with the usual vermicides has apparently no ameliorating effects. It seems possible that in some of these cases the cause of the trouble may be œstrus-ovis, and in any case Mr. King's experience will be of value to other sheep breeders in Southern Rhodesia.

FARMERS' ASSOCIATIONS.—During the last few months three new Farmers' Associations have come into being, namely, the Enterprise Farmers' Association, embracing the farms in the east of the Salisbury District; the Gatooma Farmers' Association, and the Insiza Farmers' Association. Of the Enterprise Farmers' Association Mr. G. A. Peacock, one of the oldest residents in the district, is president, and Mr. James Watson, of Kilmuir, secretary. Col. T. Tredway Leonard, F.H.R.S., is president of the Gatooma Farmers' Association. The Insiza Farmers' Association has not yet advised us of the names of their office-bearers, but the need of an association in that district has been keenly felt for some time, and its inauguration is a sure sign of the gradual coalescence of farming interests. During the last two years the increase in the number of Farmers' Associations has been very marked, and this can not be without its beneficial effect on the country, nor is this increase due entirely to the number of new farms which have been occupied but rather to the greater spirit of co-operation which is making itself felt.

The Lomagundi Farmers' Association, with a view to making its meetings more accessible to the settlers in the northern part of the district, has now decided to hold these meetings at Sinoia instead of at Eldorado as heretofore. This is an undoubted improvement since, with the recent settlement of the back blocks of the district Sinoia has become far more central for the occupied farms than Eldorado.

AGRICULTURAL LITERATURE.—Owing to the large demand for the two agricultural publications, namely, "The Pastoral Prospects of South Africa," and "Hints to South African Farmers," referred to in the last issue of the RHODESIA AGRICULTURAL JOURNAL, it is regretted that no further copies are now available, and further applications for these works cannot therefore be entertained.

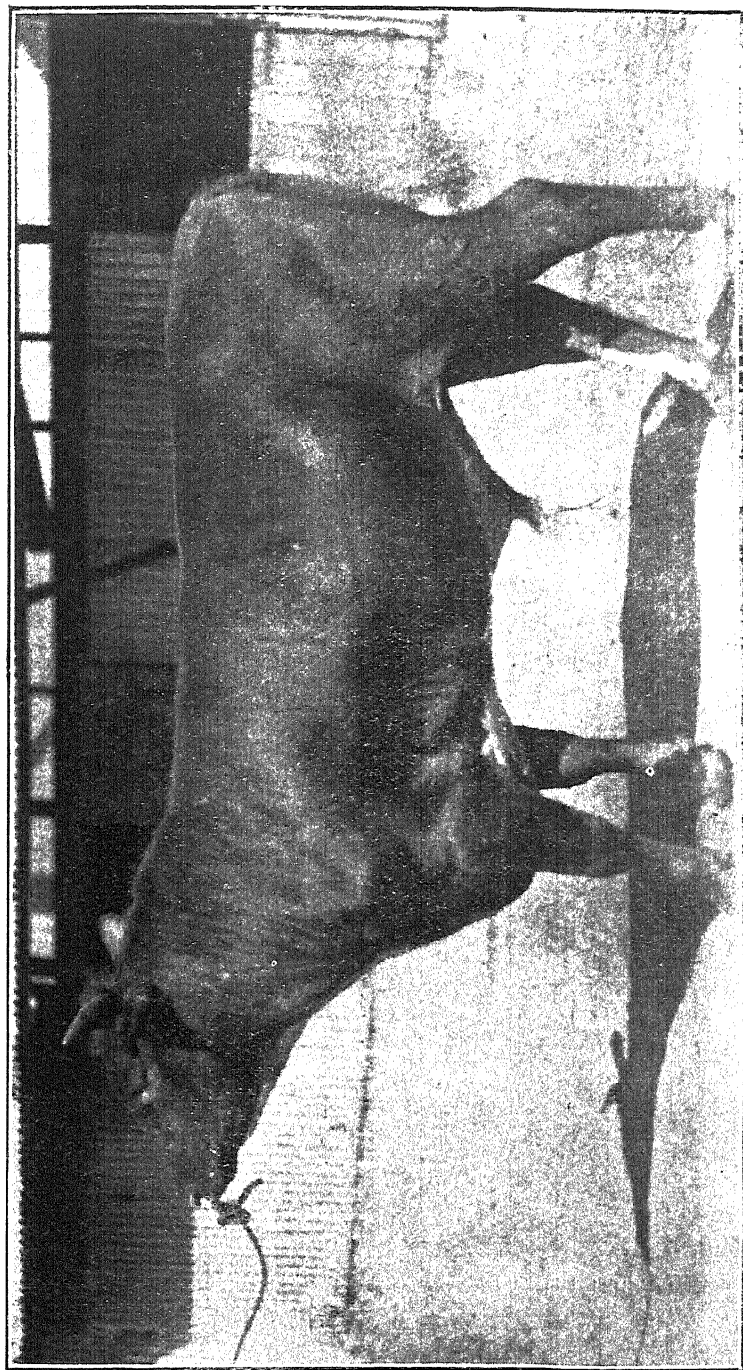
SOUTHERN RHODESIA EXPORTS.—The half yearly report of the Southern Rhodesia Customs, for the month and six months ended the 30th June, 1911, compared with the corresponding periods of 1910, makes extremely interesting reading. On turning to maize and maize meal, we find that the value of the Southern Rhodesia exports for the six months of 1911 shews an increase of fourteen thousand pounds sterling over those of the corresponding six months of 1910. Similarly with Tobacco, the figures for 1911 are £21,874 as against £15,308 for 1910. The export of Hides and Skins of oxen and cows has increased from £2,749 to £5,107, and of sheep and goats, from £1,909 to £2,919. The export of wool has been more than doubled, though as yet the figures are insignificant, yet taken as a whole these figures are of great importance as indicating the agricultural progress of the country.

On turning to the imports for a similar period a great decrease in the importation of maize is evidenced, but that of wheat and wheat products has increased from £21,997 in 1910 to £23,963 in 1911. The imports of eggs have increased in value from £3,826 for the six months of 1910 to £5,681 for the corresponding months of 1911, while imports of Butter and Cheese have increased from £10,443 to £11,086.

These figures also are significant as indicating the large markets which are open to Rhodesian farmers. It is not unreasonable to hope that, with the use of moisture retaining soils for winter cereals, the importation of wheat and wheaten products, may, in the near future, be considerably reduced, but the reason why Rhodesia should annually import something like £10,000 worth of eggs is somewhat hard to explain.

EXPORT OF CITRUS FRUIT.—We are informed by Mr. R. McIlwaine that the consignments of citrus fruit, which he has of late been sending from Orange Grove to the London market, have received very favourable comment. The report in the local papers stated that this fruit had been forwarded by the Mazoe Citrus Syndicate, but as yet the groves on this property are not in bearing.

Mr. McIlwaine has despatched a case of oranges and lemons every week since the middle of June, and the Covent Garden market authorities report that the oranges, though rather



Shorthorn Bull.—“Spice Box,” bred by Robert Bruce. Imported by W. H. Williamson, Salisbury, for Mr. A. W. Partridge



*Aberdeen Angus Bull. — "Prince Fadian," bred by D. G. Grant.
Imported by W. H. Williamson, Salisbury, for Mr. J. Cameron.*

thick skinned, are of very fair quality, and would have fetched on the market from 1s. 6d. to 2s. per dozen.

They further state that the lemons were some of the finest ever seen and of exceptionally good flavour. All the later cases of fruit arrived in England in excellent condition.

It must be mentioned that Mr. McIlwaine has been the pioneer advocate in Rhodesia of growing citrus fruits without irrigation, and while even better results may be anticipated when irrigation is possible, the above mentioned fruit was grown by carefully following out the scientific principles of *dry farming*.

PERNICIOUS (SAN JOSE) SCALE IN THE TRANSVAAL.—In the September issue of the AGRICULTURAL JOURNAL of the Union of South Africa, which is to hand as we go to press, an account appears of the recent discovery in Pretoria of the long-dreaded Pernicious Scale (*Aspidiotus perniciosus*, *Comstock*), where it appears to have been present a number of years, probably either four or seven. The pest is apparently flourishing under the climatic conditions of Pretoria, and has already caused the death of several small trees and has badly infested a larger number. Its presence was first detected in a nursery which has unfortunately distributed fruit trees and rose bushes (food plants of the scale) to a considerable extent. The limits of the pest has not yet been ascertained, but it has been proved to occur in various parts of the Pretoria district and the neighbourhood of Johannesburg, and it is probable that it will be found elsewhere.

It is satisfactory to note that the Chief Entomologist for the Union has the matter in hand, and that he has the assistance of so experienced an entomologist as Mr. C. W. Mally, Acting Entomologist for Cape Colony. It is possible, although not altogether probable, that the pest may yet be exterminated in spite of the long start it has gained, and we may at least confidently hope that its further spread will be prevented. Fortunately the trade in nursery stock between the Transvaal and Southern Rhodesia is small, and we do not expect that the pest has been introduced into this

territory. Efforts are being made to trace such consignments of nursery plants as have been forwarded from Pretoria to Southern Rhodesia of late years with a view to ascertaining if the scale has been introduced by this means, and a Government notice will be published at once prohibiting the further introduction into this territory of nursery stock from the Transvaal.

The Formation of Agricultural Credit Associations in Rhodesia.

BY LOUDON M. DOUGLAS, F.R.S.E.

In connection with the organisation of agriculture in a comparatively new country like Rhodesia, it is necessary to consider where the capital may come from to develop the various farms. At the present moment a large amount of capital has been expended in putting up buildings and supplying other equipment in connection with these farms, but the territory is vast and there is plenty of room for expansion.

FINANCIAL ASSISTANCE FOR AGRICULTURISTS.—Under ordinary circumstances the money required for such development could be obtained by mortgage from a bank, and it is quite possible when the proposed Land Bank for Rhodesia is legalised, that this course may in some cases be pursued. There are many agriculturists, however, who are not owners of the land which they farm, and it is for this class that special financial provision will have to be made.

The method of doing this, which is proposed, is by means of Agricultural Credit Associations, and it is desirable at this juncture that an explanation of how to constitute these should be given.

AGRICULTURAL CREDIT ASSOCIATIONS owe their origin to a German Burgo-Master named Frederick Wm. Raffeisen, who instituted the first in 1847-8, the ruling principle in its constitution being that all the members assumed several and joint responsibility for advances made to any member. The first Association was a very small one, but worked so well and became so famous that it was imitated throughout Germany, and since then such Associations have become common in almost every civilised country.

UNIVERSAL ADOPTION OF THE SYSTEM.—Agricultural Credit Associations advance money on reasonably small fixed

interest to borrowers who are members and who are under the obligation to apply the money to agricultural purposes. Under the system, agriculture has developed immensely in Germany, Austria, Denmark, the United States of America, the United Kingdom, Italy, Japan, Holland, Portugal, Roumania, Turkey, Sweden, Switzerland and elsewhere, and it is to the great credit of the system that, since its inception to the present day, there have hardly been any losses.

CONSTITUTION.—Briefly stated, the principles upon which Agricultural Credit Associations are based are as follows:—*

1. The operations of any one Association are confined to a specific area and are limited to its members. This limitation is such that members must know one another.

2. The loans are made purely for the development of agriculture, and with the sole object of enabling the borrower to make such a profit as will give him an opportunity of using the borrowed money to advantage, and at the same time repaying the money in a reasonable time.

3. The loans are granted for a specific period, which is governed entirely by the object to which the money is applied.

4. The applicants for membership of any Association must be men of good repute, and poverty is not a disqualification.

5. On admission to the Association, members become jointly and severally liable for the debts of the Association, that is to say, for loans granted to themselves or other members, and for all sums of money either deposited in or lent to the bank for purposes of being re-lent to the members.

6. Borrowers must comply with the following conditions:—

(a) They must be members.

(b) The purpose for which a loan is required must be stated, also the terms upon which the loan is granted.

(c) They must find two sureties who will join them in a bond, guaranteeing repayment of the loans and interest thereon, and who will further bind themselves to repay the loan in the event of its mis-application.

*The Rules given are adapted from the Report of the Irish Agricultural Organisation Society for 1910.

7. The management of the Association is vested in a Chairman and Committee elected by the members.

8. No profits earned may be divided amongst its members by bonuses or otherwise disposed of; they must be allowed to accumulate as a reserve fund, which may be used to augment the capital of the Association, and which, being free of interest, will in time enable the Association to reduce the rate of interest charged to borrowers.

9. While provision has been made for the payment of a Secretary, voluntary service is the most invariable rule. Where payment is made for a Secretary's services, it is generally merely nominal.

10. The usual rates of interest on loans are from 5% to 6%; interest is generally regulated by the rate at which capital can be obtained; a margin of about 2% between the rate of interest paid by the Association and that charged by it to borrowers being usually aimed at. Thus, if an Association borrows from the Rhodesia Land Bank at 3%, it would lend to its members at 5%.

II. SOURCE OF CAPITAL.—The capital would be derived from two different sources, viz.:—

(a) The Land Bank of Rhodesia already referred to. When it is legalised, it will grant loans at a fixed rate of interest, irrespective of any fluctuations in the Bank rate.

(b) Any individual may deposit cash with the Association at rates varying from 3% to 4%.

These notes briefly summarise the main features of the Agricultural Credit Associations, and they give a fair indication of what is generally understood in connection with their constitution.

SPECIAL CIRCUMSTANCES IN RHODESIA.—In Rhodesia there are special circumstances which will have to be considered, and which would not apply in any European country. First of all, the Associations in Rhodesia, in order to make them operative, would have to be smaller than those in Europe, and the membership, instead of being a minimum of 60, or thereby, will require to be smaller.

As has been mentioned, the security of loans granted, rests upon the personal character and repute of a borrower amongst his fellow agriculturists, and as each Association is jointly and severally responsible for the debts of borrowers, the risk of loss is small. The security is therefore very different from what is usually required in ordinary banking, and, although the security is of this personal character, it has been found to be quite sufficient for the purpose.*

TRANSVAAL REPORT.—It is of interest to know that the whole question was investigated by a Commission in the Transvaal in 1906, and the report issued by it shews that the members came to the conclusion that Co-operative Societies such as Agricultural Credit Associations should assist the Transvaal Land Bank.†

- (a) By providing a new form of security, viz., Co-operative Credit, on which advances can safely be made.
- (b) By establishing local Executive Committees who would:
 - (1) Constitute in each district an unpaid Advisory Staff.
 - (2) Also act as unpaid Inspectors; since it would be to the interest of such Executive Committees to see that those of their members who were granted loans applied them to proper uses.

THE RHODESIAN LAND BANK.—At the present moment there are no such Associations as have been described, in connection with agriculture in Rhodesia, and no place to which an Agricultural Credit Association might apply for the capital it would wish to obtain on personal security. The Rhodesian Land Bank will undoubtedly be constituted by legal process, but that will take some time to accomplish, and in the meantime Agricultural Credit is urgently needed in order to develop the country.

METHOD OF ORGANISATION.—There are twenty-seven Farmers' Associations at present in Southern Rhodesia, and I suggest that these Associations should form Agri-

* See Bulletin of the Bureau of Economic & Social Intelligence, issued by the International Institute of Agriculture at Rome, 1910.

† See Report of Transvaal Land Bank Commission, 4th March, 1907.

cultural Credit Associations in their neighbourhoods, and that the membership should be largely drawn from the existing Associations. In this way, if a certain number of farmers in any district will at once associate themselves together, and subscribe to the rules which will be necessary, it may be possible to provide the funds at once. The British South Africa Company will certainly favourably consider the needs of any such properly constituted associations and will be prepared to advance the necessary loans on the understanding that when the Rhodesian Land Bank is legally constituted, it will assume responsibility for such loans. I would suggest that it is advisable that Committees should be formed in different districts forthwith, and I shall be very pleased to forward copies of rules and such other forms as will be necessary.

AGRICULTURAL CREDIT ASSOCIATIONS BASED ON MUTUAL HELP.—It must be understood that Agricultural Credit Associations should only be called into existence where there is an obvious need for them and that only the conviction that good will result should influence the promoters. The principal thing to recognise is that these Associations exist for the purpose of mutual help, and, if properly organised they are likely to exert a great influence in the development of Rhodesia.

I have purposely refrained from specifically mentioning any particular branch of agriculture to which loans obtained from an Agricultural Credit Association might be applied, as, so long as the money is used in the development of any one branch, it will have fulfilled the purpose intended.

ENQUIRIES AND CORRESPONDENCE INVITED.—I shall be glad to answer any further questions in connection with this matter and invite all who are interested to address me at the Department of Agriculture, Salisbury. I would further suggest that meetings of Farmers' Associations should be held to discuss this important matter, and I will, as far as possible, endeavour to attend some of these meetings. It is highly desirable that there should be preliminary discussions so that the matter may become thoroughly understood.

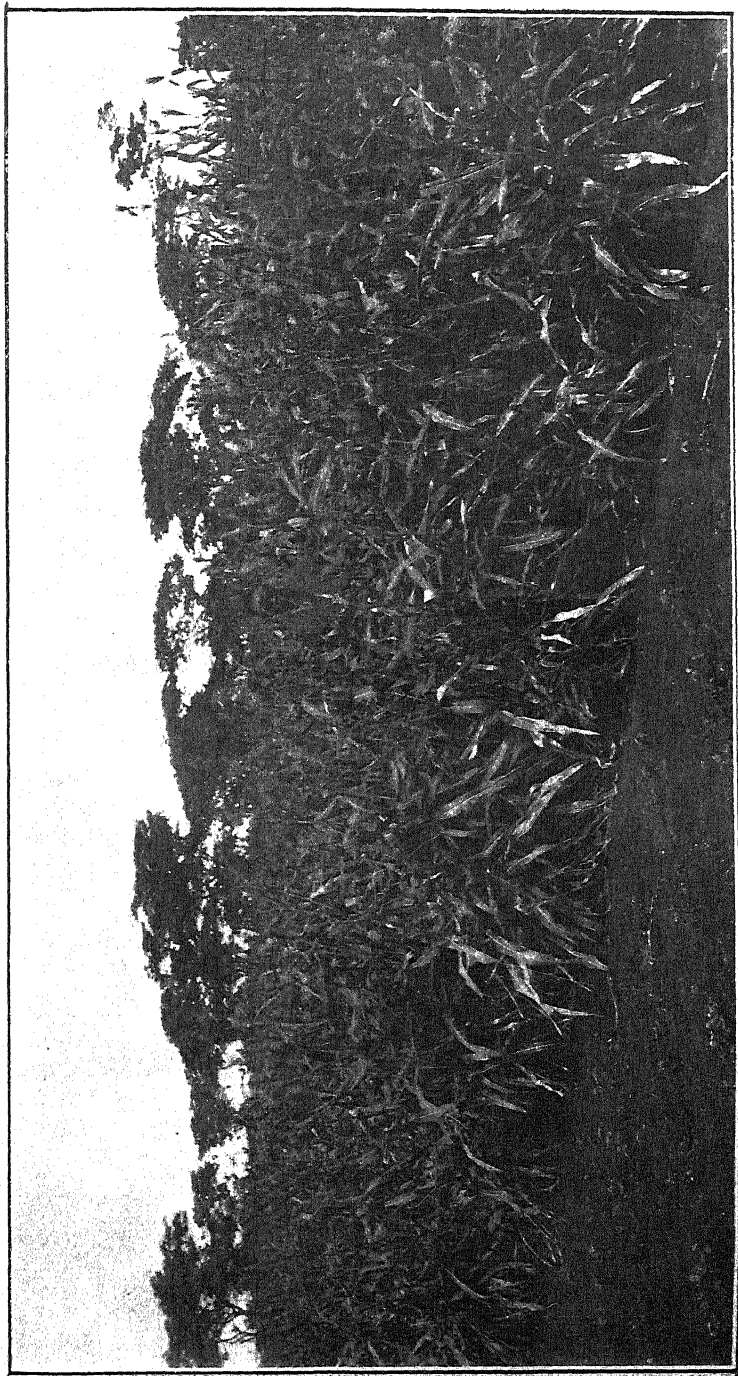
Second Report on Experiments.

BOTANICAL EXPERIMENT STATION, SALISBURY,
1910-II.

By J. H. HAMPTON.

(Continued.)

LINSEED (*Linum usitatissimum*).—The success which attended the trials of a local variety of Linseed last season on new ground both at the Experiment Station, Salisbury, and on the Gwibi Experiment Farm, was sufficient to warrant further trials with several varieties this season. The great objection to the local variety is that it ripens unevenly and so entails either cutting when only part of the crop has matured or leaving it until the whole has ripened, by which time a considerable amount of seed has been shed. This season, besides the local variety, four others were tried, and three of these—Pskoff, White-flowering and Yellow-seeded Linseed—have proved to be much earlier and also to ripen evenly. The fourth variety—Argentine Linseed—was found to be identical with the variety already grown locally. Seed was sown broadcast on December 23rd, at the rate of 25lbs. per acre, on land which carried maize the previous year. The Pskoff Linseed proved to be the earliest strain, ripening in less than four months and producing a yield of 620lbs. of clean seed per acre. On April 25th, the Yellow-Seeded and White-Flowering Linseed were cut. The former yielded 600lbs. and the latter 640lbs. of seed per acre. The local and Argentine varieties could not be reaped until the 5th June, and even then a large number of immature heads were in evidence. The seed of the Argentine Linseed is much larger than the three earlier varieties, and would possibly command a higher price on the market. The yield, however, of 600lbs. per acre places it slightly below both the Pskoff and White-flowering varieties. Further information regarding Linseed is given in the article entitled, "Possibilities of an Export Trade in Oil Seeds," which appeared in the June (1911) issue of this Journal.



Teosinte on the Botanical Experiment Station, Salisbury

ROOT CROPS.

MANGELS AND SUGAR BEET.—The need of succulent winter feed for dairy cattle has long been felt in Rhodesia, and it may be a surprise to some farmers to learn the favourable results which have attended the experiments with root crops during the past season. All varieties tried have done moderately well, but none have given better results than Mangels and Sugar Beet.

Four varieties of Mangels and two of Sugar Beet, were tested on new ground which had been dressed in October with kraal manure at the rate of 12 tons per acre and 50 lbs. nitrate of soda per acre immediately after "brairding."

The Mangels tested were Half-sugar, Yellow Globe, Mammoth Long Red, and Crimson Tankard, whilst the Sugar Beets were Vilmorins Improved and Giant Half-Rose. The seed was sown on the 18th December with a small hand-planter in rows 18 inches apart. The germination was good and the growth rapid. A month after sowing the plants were singled out to stand from 9 to 10 inches apart in the rows. When the roots were firmly established a light one-mule cultivator was run between the rows, and about a month later it was found necessary to remove the weeds by hand cultivation. On May the 5th, four-and-a-half months after sowing, an estimate was taken of the yield of each variety, and it was found that the weight of roots per acre in the case of the Half-Sugar Mangel amounted to $21\frac{1}{4}$ tons, of the Yellow Globe to $12\frac{1}{4}$ tons, of the Mammoth Long Red to 11 tons, and of the Crimson Tankard to 10 tons. The yield per acre of Vilmorins Improved Sugar Beet was $7\frac{3}{4}$ tons, and of Giant Half-Rose $16\frac{1}{2}$ tons. The sugar content of the latter was extremely low, however, being only 7.9 per cent.

SWEDES AND KOHL RABI.—Three varieties of Swedes—Magnum Bonum, Purple Top and Bronze Top Swede—and Green Top Kohl Rabi were sown in the same manner as the mangels and on ground treated similarly. Germination and growth were good until the plants had reached a height of three or four inches when they suffered from the attacks of the saw-fly caterpillar which practically defoliated the young plants. After spraying with a solution of lead arsenate and

brown sugar the Swedes recovered to a certain extent, but it was found necessary to re-sow the Kohl Rabi. Towards the end of March, when the Swedes had been more or less established, a species of "green aphid" attacked the leaves and wrought considerable damage. A poor crop, of about 5 tons per acre in each case of fair-sized roots, resulted. The growth from the second sowing of Kohl Rabi progressed satisfactorily and the crop reached maturity without being further affected by any pests. It would appear that the late sowing of Kohl Rabi is advisable as the crop might then avoid the ravages of the sawfly, but further experiments must be conducted before an opinion on this point can be expressed.

CARROTS.—Two varieties of Carrots, namely, White Belgian and Red Intermediate, were tested under similar conditions to the mangels and swedes. A poor germination resulted, and it was found necessary to re-sow in the blank spaces which caused an uneven growth in the roots. The White Belgian strain proved the more prolific cropper with a yield of about six tons to the acre, whilst the Red Intermediate only yielded about four tons to the acre. Had the seed germinated well, a much better yield would doubtless have resulted, particularly with the latter variety, which suffered most in this respect. The roots were in both cases of good size and quality.

The fact that Mangels, Sugar Beet and Carrots were in no way affected by the pests which did such damage to Swedes and Kohl Rabi sown on adjoining plots and under similar conditions makes it evident that, with suitable varieties and proper attention, there is less risk in growing these crops than the latter. Mangels have done well in many parts of Southern Rhodesia, and the crop can safely be grown on a large scale since the value of the roots as a succulent feed for cattle, sheep and pigs during the dry season is universally recognised.

Several methods of preserving the roots after removal from the ground were tried, and it was found that the best and simplest arrangement is to build them in clamps on a bed of hay or straw with a layer of the same material between each layer of roots. The whole clamp should then be covered with hay and soil to a depth of about one foot, leaving the hay to protrude through the soil at the top in

several funnels so as to allow a passage for the air and prevent heating. In performing this work the roots should be handled with care, and placed gently on each layer of hay as one bruised root may contaminate all the others. In one clamp, where the roots were heaped up carelessly without sufficient hay between the layers, every root had rotted within a month from the time of storing. A few roots of each variety were left in the ground until the end of August and in spite of the severe cold they apparently suffered no deterioration, and have since been lifted and fed to stock.

RAPE.—Of the three varieties of Rape tried this season—German Winter, German Summer, and Broad-leafed Essex Rape—only the last has given anything approaching satisfactory results. The two former were entirely destroyed by the attacks of the same pests that did such injury to Swedes. Broad-leafed Essex Rape was sown on the 11th January in rows 18 inches apart at the rate of 6 lbs. per acre, and the crop was thinned out a month later. The plants, although retarded in growth by the same causes that destroyed the other varieties, recovered sufficiently to give a fairly good crop, which has formed most valuable feed for the sheep during the past two months (May and June). Owing to the pests to which the Cruciferæ are subject, it may be somewhat risky for farmers to attempt sowing these crops on too large a scale until more extensive trials have been carried out and a practical method has been discovered of combatting the injurious effects of the saw fly and aphids. The latter, however, does not make its appearance until the close of the rainy season, and if Rape is sown about the end of January between drills of maize there is every reason to believe that a good bite of green stuff will be obtainable during May and June. If fed down early, the plants make a strong re-growth and can be fed off more than once.

BEANS AND PEAS FOR HUMAN CONSUMPTION.—Two varieties of beans—White Haricot and Red Canadian Wonder—and one of peas—Rivenhill Wonder—were tested during the past season on three 1-12 acre plots. The seed of each was sown on December 24, in rows 15 ins. apart at the rate of 18 lbs per acre. The germination was good and the subsequent growth so rapid that the beans were pulled in just

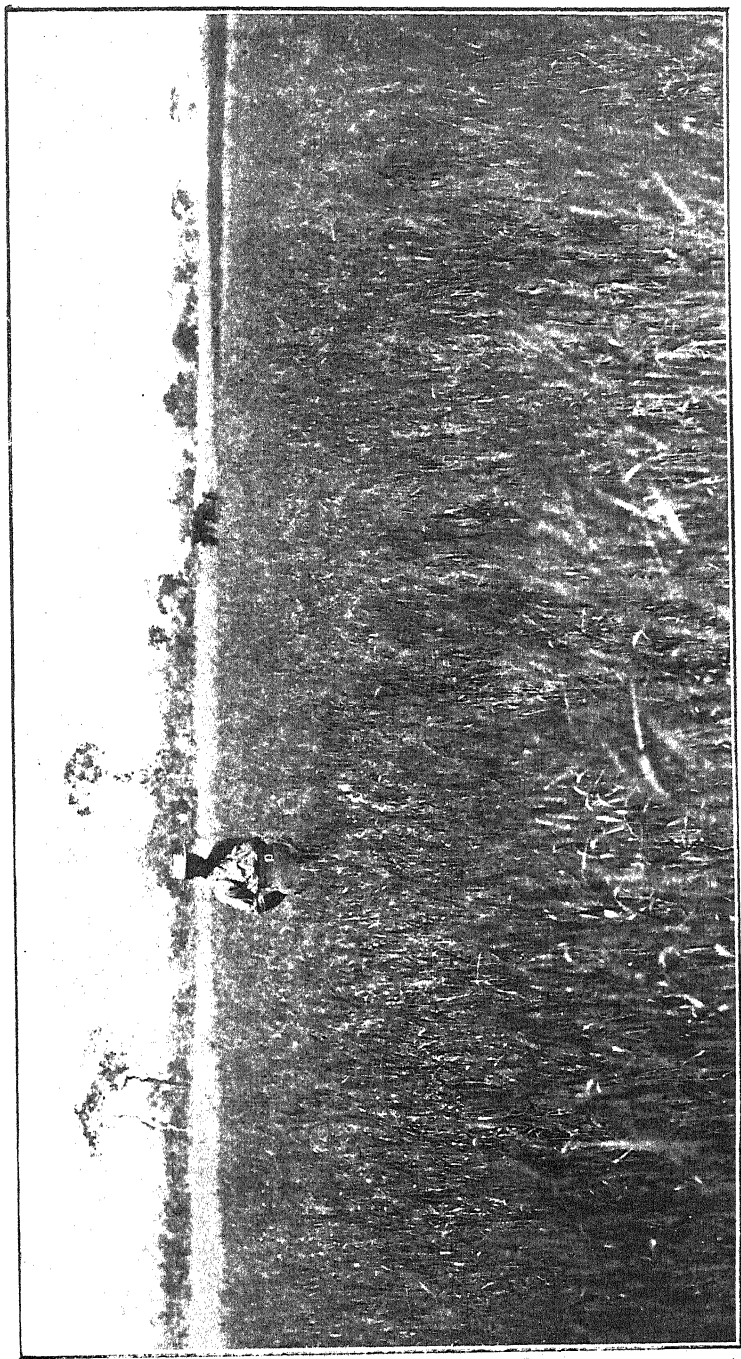
over three months from time of sowing. The peas were about a fortnight later in maturing, being pulled on the 10th April.

Upon estimating the yield of each, it was found that the Canadian Wonder Bean produced 1,080 lbs. or 5½ bags, the White Haricot Bean 1,000 lbs. or 5 bags, and the Rivenhill Wonder Pea 450 lbs. per acre. The present price of beans is about 30/- per sack of 200 lbs., so that a yield of 5 bags gives a return of £7 10s. per acre. A ready market can always be found for beans especially in the vicinity of mines, where they form a necessary adjunct to the rations of natives employed thereon. The bean crop is easily grown, matures quickly, and thrives on most soils. Its chief enemy in Rhodesia is the red and black beetle but, as with most other crops, if grown on a fairly large scale the damage done by these insects is usually comparatively small. The cost of harvesting and threshing is often a somewhat serious hindrance to extensive planting, and it would be of interest to learn whether the large power threshing machines now in use for maize could not be adjusted for dealing with beans also.

PASTURE PLANTS AND GRASSES.

PASPALUM (*Paspalum dilatatum*).—Extensive cultivation of this grass has been carried on throughout Southern Rhodesia during the past two years, and in almost all cases the crop has been a success. The best results have been obtained from the black vlei lands, where the effect of frost is counteracted by the moisture retaining qualities of the soil, thus producing a quick re-growth of the grass after the frosts are ended.

In December, 1909, a quarter-acre plot of new land at the Government Experiment Station was planted with paspalum slips, in rows 2ft. x 18ins. The plants grew rapidly from the beginning and by the end of the summer of 1910 had almost met in the rows. The grass suffered from the frosts which prevailed during the month of July, but although the outer leaves became withered the crown of each plant remained green throughout the winter.



Summer Wheat, Victoria, on the Government Experiment Farm, Geelong. Taken February 23.

The stand quickly recovered on the advent of the rains, and by the beginning of December, 1910, the plants were as robust as ever and would have afforded a plentiful and luscious pasture for sheep or cattle. With the exception of eradicating, by hand, a few foreign grasses and weeds, the plot received no attention, yet, by the end of February, the plants had "stooled out" so well that they covered the ground between the rows, some of them attaining a diameter of from two to three feet. The grass was then very thick and stood from six to nine inches in height. Part of the plot was fed off by sheep during March, and it is remarkable that at the present date (August 18th) the depastured plants, although smaller, are much greener than those which have not been fed down. In spite of the exceptional cold of this winter the stand has remained green throughout and would have afforded a considerable amount of excellent grazing.

TOOWOMBA CANARY GRASS (*Phalaris bulbosa*).—The plot adjoining the paspalum was planted at the same time and in the same manner with slips of *Phalaris bulbosa*, so that a comparative trial might be made of these two grasses. On dry red land this grass grows taller than the paspalum, but does not cover the ground so well. However, *Phalaris bulbosa* appears to give the best results on moist soil and is usually more resistant to frost than paspalum. It was noticed that although the paspalum withstood the drought better, the *Phalaris* recovered quicker when the rains commenced. The sheep also at first preferred the *Phalaris*, as it is finer in texture than paspalum.

Several reports have also come to hand regarding the success of phalaris from seed and slips supplied under the usual terms of co-operative experiments. On one farm, and on rich sandy soil, a few plants after six months growth are reported to have attained a diameter of three feet with the grass nine inches high, and to have remained green throughout the winter.

Now that a further impetus has been given to stock raising through the introduction of pedigree bulls from England it behoves farmers to provide more succulent grasses than the Rhodesian veld affords. Both *Paspalum dilatatum* and *Phalaris bulbosa* can be confidently recommended for more

extensive trial, and those farmers, who have not already done so, should bring as large an acreage as possible under one or both of these grasses.

SHEEP'S BURNET (*Sanguisorba minor*).—The half acre plot of Sheep's Burnet laid down in December, 1909, has given very satisfactory results during the past season. It afforded a good supply of pasture for the sheep during the summer and early winter months, and at the present time (August 22nd) is quite green and does not yet seem to have been affected by either frost or drought. The sheep did not relish the burnet at first, but after the first week they fed it down with avidity.

The seed was sown in drills one foot apart. The germination and stand were good with the result that by the end of the summer of 1910 the crop had become sufficiently established to allow of its being grazed off by the cattle. The plants did not lose verdure during the winter like most of the other pasture plants and grasses on the Experiment Station, and would have afforded a fair amount of grazing for sheep or goats. With the first rains in October, 1910, the crop made rapid growth, and by the beginning of January the plants had reached a height of from nine to ten inches, and had completely covered the ground between the rows. When this growth had been eaten down by the sheep, the plot was allowed to rest for two months, during which time the growth was as luxuriant as ever and the resulting crop afforded another month's pasture to the thirty odd sheep placed upon it.

The fact that this perennial crop is easily established, is free from pests of any kind, and is so little affected by either frost or drought, makes it one that can safely be sown more extensively both as a pure stand or mixed with other hardy grasses.

Of the other pasture plants and grasses that have been tried on the Experiment plots, the most successful are Cow-grass Clover, Sainfoin, African Sulla, Tall Fescue Grass and Cocksfoot; but all these are likely to do better when mixed with other grasses from which they will receive a certain amount of shelter. Cocksfoot, Awnless Brome Grass and

Tall Fescue have done moderately well as pure sowings on red soil, and will probably prove even more satisfactory if established on land of a moisture retaining character. Further trial with these, however, is necessary before they can be definitely recommended for extensive sowings.

A quarter acre plot of South African Red Top Grass grown from seed planted on the 14th January gave 300 lbs. of excellent hay after four months growth. Perhaps a good nurse crop to the above grasses may be found in Red Top Grass, which seems to flourish well in Rhodesia on almost all soils.

Oestrus-ovis in Sheep.

By ALEC KING.

A few months ago my sheep started to fall off very much in condition, so much so that some of last season's lambs got so low that they commenced to die. I had them opened up and made a very careful examination, but could not find any trace of internal disease. We first thought they were suffering from worms; so dosed them for both tape and wire worm—without any improvement. They simply went on pining away.

I was at a loss for some time to find the cause of death, until, in fact, it struck me to open the head and examine that. To my great surprise, I found in all cases that the sheep had maggots in the nostrils. Oestrus-ovis I think it is.

These maggots, or "Grubs," seem to get right up the nasal passages, and in many cases enter the brain—which, together with the emancipated condition of the sheep—causes death. The first symptoms are a nasty discharge from the nostrils, as though the animals had bad colds, and this gradually thickens as time goes on.

On finding this out, I spoke to a friend of mine, who told me that they had something of the same kind in America, and they used a solution of corrosive sublimate of 1 in 1,000. This is injected with a small glass syringe into each nostril, the sheep being held on its back for a few seconds to let the fluid get well up the passages.

I obtained a bottle of corrosive sublimate tabloids from the chemist and followed these instructions. After the first application, there was quite a marked improvement in the sheep. Four days later we repeated the dose, and during the operation we noticed that some of the sheep sneezed and brought out the grubs or maggots, some dead and a few not quite dead—just moving.

I took the sheep that died after the first application of sublimate and opened them, and found that in some cases there were a great number of these grubs in the head, as many as fifteen in a single sheep. All those maggots that the sublimate could get to were dead or dying.

It seems necessary to repeat the injections at intervals of a week, three or four times or even more. Since the second injection my sheep have picked up in condition and brightened up wonderfully, and deaths are now quite rare, only a few that were too far gone with poverty having since succumbed.

In the future, as soon as I find the sheep discharging from the nostrils, I shall use this remedy. It appears to me that the fly deposits the grub in the outer opening of the sheep's nostrils, and they work up the nasal passages gradually, growing as they get higher and higher and as they come to maturity. The eggs are deposited during the hot summer months, and the grub is fully matured in the following spring.

I am writing this thinking it may be of some use and help to farmers in Rhodesia, since I should not be at all surprised if this would account for a great deal of the loss in sheep here. Several people in this district have been very heavy losers of sheep in past years, and this season seems exceptionally bad.

[Cases are not infrequently reported to us where the use of Cooper's dip, blue stone, or Bert. Bowker's cure has proved ineffective in reducing the mortality amongst sheep. Farmers who have suffered in this way would do well to follow Mr. King's example, and to examine the sheep for parasites in the nasal cavities.—Ed. R.A.J.]

The Breeds and Breeding of Swine.

By LOUDON M. DOUGLAS, F.R.S.E.

The breeding of swine has always formed a leading feature in agricultural pursuits, and, from primitive times to the present day, there are continuous records to show that this form of live stock has been constantly kept. The methods of handling were different from what they are now, and as a consequence distinct types were not much in evidence. What is called the pure bred or pedigree animal is a modern product. Specializing different types has led to the formation of pure breed societies, and the establishment of herd books so that accurate records of the purity of breeds are now available. This remark applies to all pig-breeding countries, and means that, at the present day, all such countries have their own types, which are guarded and perpetuated to such an extent that they form large distinct races.

It will be convenient to consider the various British breeds first, as they have had such a strong influence in modifying the types in all countries.

We know at the present day, six principal breeds of swine in the United Kingdom. The are :—

THE LARGE WHITE YORKSHIRE.

THE MIDDLE WHITE.

THE TAMWORTH.

THE BERKSHIRE.

THE LINCOLNSHIRE CURLY COATED.

THE LARGE BLACK SWINE.

In addition to these we have many varieties of less importance, such as the Small White, the Small Black, the Spotted Gloucester, the Ulster breed and others, but none of these auxiliary types are of sufficient importance to

warrant their being specially classified, and in fact they are gradually disappearing before those of the recognised types.

THE LARGE WHITE YORKSHIRE was known in the North of England about the beginning of the eighteenth century, and was then an ungainly and unprofitable animal. A celebrated agriculturalist, Robert Bakewell, began to take an interest in the breed about 1760, and by careful selection brought out the Large White Yorkshire type which we know at the present day, and whose principal characteristics are so wanted by bacon curers. These animals fatten rapidly and provide the long slab side so frequently wanted by Wiltshire bacon curers; they mature in about seven months if kept in healthy surroundings and are fed systematically, on proper rations. At the age of seven months a well cared for Large Yorkshire pig will weigh 200 to 220 pounds live weight.

THE MIDDLE YORKSHIRE.—Second in importance to the Large Yorkshire is the Middle Yorkshire, which is distinguished from the large breed; it has a characteristic long head with a light jowl, whereas the Middle White has a short head and a heavy jowl. The Middle White takes longer to mature to bacon weights than the large breed, but it is very extensively cultivated for bacon, as the texture of the meat is of a high quality.

THE TAMWORTH breed of pigs is notable because of its reddish brown colour. This type is cultivated mostly for crossing purposes as, by itself, it is a very unprofitable animal. It is long in the limb and flat in the ribs, but it produces lean flesh and in crossing with either Middle White Yorks or Berkshires it provides that streaky flesh which is wanted in bacon.

THE BERKSHIRE is one of the popular breeds in England. It is black in colour and rather short set; there being a large proportion of flesh to bone. The true type is always black in colour, with short face, broad back and massive shoulders and hindquarters. The Berkshire breed owes its present high position to the Royal Agricultural Society in England, which instituted a class for it in 1862. It is since then that it has come into such prominence.

The Berkshire type is one which is admirably adapted for warm countries and would suit sub-tropical conditions, as it is of the colour which seems to be wanted in warm climates, viz.: black. It is at the same time hardy and not so liable to disease as some of the other breeds. It is also a desirable animal for crossing with native breeds, more especially if the cross is with the Berkshire sire.

THE LINCOLNSHIRE CURLY COATED PIG is a comparatively new type which has only come into prominence during recent years. It is claimed for it that it is a quick feeder and arrives at maturity early. It is white in colour and the hair is dense, wavy and curly. There are no records of the manner in which the breed has thriven in warm countries, so that while it may be highly successful in the low lying lands of the East of England, it has yet to be tried under sub-tropical conditions.

THE LARGE BLACK PIG has its chief home in Sussex and it seems to have been derived from the Essex breed. It has been specialized only within the last two decades, but, since the establishment of the Large Black Pig Society in 1899, it has risen in public favour as a bacon pig. It matures very rapidly, is hardy, and has a large proportion of lean to fat and flesh to bone. A favourite cross is between the Large Black and the Berkshire, the result being an animal which is shorter in the neck than the Large Black, but longer and deeper in the side than the Berkshire.

Everything points to the Large Black breed being the most suitable one for Rhodesia, but it may be considered desirable later on to occasionally introduce some Berkshire and Tamworth blood.

THE PIGS OF THE UNITED STATES.—There are quite different types of pigs in the United States, notable amongst them being the three breeds: The Chester White, the Poland-China, and the Duroc-Jersey. The Chester White originally came from England and was started by two fine white pigs imported from Bedfordshire to Chester County, Pennsylvania. Since then the type has been improved until it is now one of the leading breeds in America. The history of the breed indicates what might take place in such a country

as Rhodesia, as it is most likely that in the future, one type will be found more suitable to the climatic conditions than any other.

THE POLAND-CHINA is another of the types which has been developed in the United States in much the same way. It was evolved out of the extremely cosmopolitan stock introduced by the early British settlers and now occupies the position of being the principal breed in the great corn belt, being utilised for rapidly converting maize into pork and lard. There is no doubt that for rapidly fattening qualities there is no better pig than the Poland-China and more especially where the principal food is maize. Very fat meats are, however, not wanted in South Africa or the United Kingdom, and it would hardly do to grow pigs for their lard qualities alone.

THE DUROC-JERSEY breed is another which has risen to somewhat the same prominence as the other two mentioned. The colour is cherry red and is a feature which has been perpetuated since the early introduction of English stock.

DANISH PIGS.—The swine industry of Denmark has been one of phenomenal growth. There seems to have been representatives of the original breeds in existence in 1850, but they were gradually eliminated by the introduction of foreign stock, mostly British, which by careful selection have produced the present predominating breed called the LAND RACE, and which is specially adapted for producing long sides of bacon for British markets.

There are many other breeds of pigs in other countries, such as the Craonnais in France, the Mangalicza in Hungary and Servia, and the White Breeds in Germany, but none of them are of any interest from the bacon curing point of view. It seems to be generally admitted that where bacon stock is necessary to either modify the native breeds or start new types, it must come from the pure breeds of the United Kingdom.

THE BREEDING OF PIGS.—It is evident that the conformation of pigs is entirely regulated by the requirements of bacon curers, hence the pure breeds referred to are used as

the means of producing the bacon pig, and which does not conform exactly to the features of any of the breeds.

The requirements are : A neat head, short neck and light shoulder, thick loins, short legs, length of side and square hams.

Such requirements are regulated to a large extent by the boar, which should be selected with a view to transmit these qualities. It does not very much matter about the sow. There are a few points that may be well to remember, however, such as, that docility of temperament is highly desirable. The sow should have a full complement of twelve teats, evenly placed well forward in the body.

A sow will go sixteen weeks in pig, and during that period should be allowed to graze as much as possible, picking up green fodder. A small amount of dry food in slop is necessary until the last eight weeks when plenty of nourishing food, such as ground maize mixed with ground barley in slop should be given. When the young pigs are being reared, cooked food, consisting of potatoes, bran, maize in small quantity, and, if possible, skim milk, should be fed.

In three weeks' time the young pigs begin to eat, and it is then that they should be encouraged to eat slops of bran, maize and potatoes. Milk should be given wherever it is available. At eight weeks the young pigs are weaned and then may be started out to graze on green fodder varied with a limited quantity of moistened ground maize.

At the weight of about 1 cwt. the pigs will fatten rapidly, and can be turned into fenced off mealie patches to find their own food from the stalks and corns. The excess of oil in the corn will be corrected by the green leaves eaten at the same time. Water must always be available under such circumstances. It is a very good plan to plant pumpkins or melons between the rows of mealies so that they can be eaten at will by the pigs. They provide splendid succulent food.

It may be taken as having been accurately determined, that warm food made from cereals or from mealies mixed with other grains and water or milk give the best results

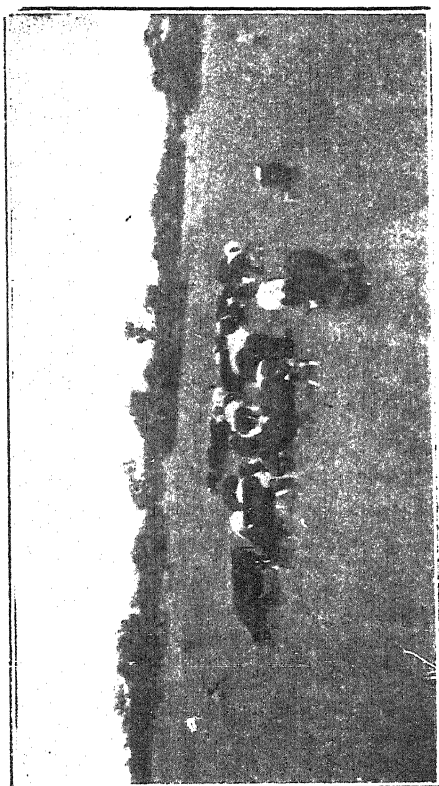
when given warm, or, to be more precise, at a temperature of about 90 degrees F. There will be least waste under such conditions.

Youatt, who was one of the early writers on Swine Husbandry, lays great stress on regular feeding. He says: "Regular hours of feeding, rank among the first of the rules which ought to be observed; the pigs will soon learn to expect their meals at certain times and the stomachs will be ready for them; irregularity will therefore irritate the digestive powers and prevent so much benefit derived from the meals when they do come."

THE HOUSING OF PIGS.—A great deal depends on the housing of pigs. It does not very much matter whether the quarters are luxuriant or not so long as they are serviceable and clean. Cleanliness is the first essential of good swine husbandry. Time was when it was supposed that the pig was fond of uncleanly surroundings. That notion, like a good many others about the pig that are false, has disappeared, and we now find that the modern swine breeder houses his pigs in properly designed buildings where breeding and the early stages of the pig's existence may be carefully tended. It is by such means that healthy profitable stock is produced.

PIGS IN RHODESIA.—The question now arises as to what kind of pigs will suit Rhodesian conditions. That is a question which, without experiment, is difficult to answer. I would first of all assume that coloured pigs would be best and that, seeing that the principal food available is maize, it would be desirable to have the Large Black Sussex breed to begin with. If boars of this breed are introduced into this country it would not take long to demonstrate their lasting qualities, but I also think that it would be well to start an experimental station where the food stuffs of the country could be fed in definite quantities and on a thoroughly scientific system so as to ascertain in that way much valuable data. I am glad to think that this suggestion is likely to be carried out at once. I would also suggest that a herd book should be started at once so as to provide a register not only of animals imported but also keep an accurate record of the progeny. This also is being arranged.

All this requires time to carry out, but it is well worth doing, as the outlet for pig products not only in Rhodesia but in the South African Union, is so large. The discrepancy between the average price of pigs in Rhodesia and the price of bacon is enormous. The price of pigs is given at 4d. per lb. and the selling price of bacon at from 1'6 to 3'/- per lb. That fact alone would seem to show that there is plenty of room for development in Swine Husbandry.



*Friesland Heifers imported from the Cape Province by Mr.
J. S. Struthers, Mungwa, Lomagundi. On the road from
Gadzema to Sinoid.*

Hints on Irrigation.

PIPES AND PIPE LAYING.

By W. M. WATT, Agricultural Engineer.

As many fallacies are current in the lay mind with reference to the principals connected with this subject, it is proposed in this article to give a few hints which may be of use to any farmer having occasion to lay down a pipe-line.

Pipes for the conduct of water are made of various materials, such as: wood, earthenware, cement, cast-iron, wrought iron, steel, etc. Wooden pipes are not likely to prove of much value in a country so subject as this to the ravages of insect pests, such as white ants and wood borers, and earthenware and cement pipes are not likely to come into much vogue, owing to their great weight and the consequent heavy cost of transport, and further, possibly, owing to the fact that jointing of this class of pipe is not usually suited to withstand high pressures. Between cast iron and steel pipes there is little to choose so far as strength is concerned. Steel pipes to withstand the same pressure as cast iron pipes, can be made much thinner, and consequently are much lighter, so that their transport is less expensive; and, in an inland territory such as this is, this is a strong argument in their favour. On behalf of cast-iron pipes it may be said that the extra thickness necessary for their strength is more likely to withstand erosive, and in some cases corrosive action, of water flowing through them, and that they would take longer to completely oxidize (rust) than a steel pipe of similar strength but less thickness. Cast-iron pipes, owing to their extra weight, are made in shorter lengths than steel pipes, and this naturally adds somewhat to the cost of laying. Cast-iron is more brittle and less malleable than mild steel, so that when roughly handled or dumped down a cast-iron pipe might break when a mild steel pipe might only be dented.

For small pipe lines of not more than about 4 inches in diameter, galvanized wrought-iron pipes might be used. Galvanized wrought-iron pipes are generally jointed together by means of a screw coupling.

The methods used for jointing cast-iron pipes is generally by means of bolting the flanged ends of any two pipes together having previously inserted a washer of lead, gutta-percha, or other material or composition, or by means of a lead spigot and faucet joint.

Steel pipes may be screw-jointed, flange-jointed or lead-jointed, but for pipes of 4 inch diameter and over the writer would recommend a lead joint unless there is some particular reason for another class of joint.

Where steel pipes are used, bends, tee pieces, or other special pipes are generally made of cast-iron, with double sockets, double spigot steel pipes being utilized to link up.

In a large order for steel piping the following particulars might be inserted in the specification:—These particulars have been extracted from a specification prepared for the Nuy Irrigation Works, by the Irrigation Department of the Cape, upon the construction of which works the writer was in charge.

“The pipes shall be straight spigot and socket steel pipes from feet to feet in length, as set forth in the schedule attached to this specification. The length being measured from the end of the spigot to the back end of the socket, so that the length named shall be the length covered by the pipes when laid. The internal diameter shall be inches, and the pipes shall be formed of the best mild steel plates inches thick, and be welded longitudinally. The metal used shall stand the following tests:—Tensile strain. 27 to 30 tons per square inch, with an elongation of not less than 21% in a length of 10 inches.

“Strips 3 inches wide cut off the plates ($\frac{1}{4}$ inch) thick in their natural state shall stand without fracture bending cold to a radius of $\frac{1}{2}$ inch inside the bend.

“The pipes shall be delivered truly circular in cross section throughout their length, perfectly straight and of the exact diameter specified. Whatever kind of socket it is proposed

to supply, must be of such dimension as to allow of a thickness of inch of lead all round and of a depth of inch of yarn, and inches of lead in the joint.

“The steel pipes shall, after being tested, be heated and dipped vertically in a hot solution of Dr. Angus Smith's Composition, which is maintained at a sufficiently high temperature in a properly constructed bath. Great care must be taken to remove any rust which may have formed before the coating is applied. The coating, when set, must produce both within and without the pipes a smooth evenly laid, glossy, dry and irremovable covering, not liable to scale off or become detached by blows or friction, nor to soften by the solar heat.”

In a large order for cast-iron pipes the following particulars might be inserted in the specification. These particulars are also extracted from a specification prepared for the Nuy Irrigation Works.

“The castings shall be accurately made to the forms and dimensions specified, or shown upon the drawing. They shall be cast in warm or dry sand sufficiently fine and fresh to produce a smooth and perfect surface, and all moulds and cores shall be properly black washed and carefully dried.

“The castings shall not be removed from the moulds, until ample time has been allowed for them to become sufficiently cool to be removed without fear of chill, and when so removed they shall not be laid upon cold or damp earth, or exposed to rain or cold.

“The metal used shall be pig iron without the admixture of cinder iron or other inferior material, and shall give castings of a tough close grained grey metal, not showing a white or vitreous surface on fracture. The castings shall be free from scorixæ, sand holes, air bubbles, cold shuts or other imperfections, and shall not be too hard to prevent without difficulty the cutting or drilling and tapping of a pipe if so required.

“Test bars 1 inch wide by 2 inches deep, and 40 inches long and weighing not more than 21lbs., shall, when supported at points 36 inches apart, sustain a weight of 28 cwts., applied midway between the points of support for such length of time as may be ordered. The weight shall then be gradually

increased until the bar is broken. If any test bar shall fail to satisfy this test, unless it be obviously a defective casting, any work cast from the same metal shall be rejected.

"The castings shall be perfectly fettled and cleaned upon removal from the mould, but no plugging or stopping of any defects will be permitted."

All defective castings should be rejected, and pipes coated in the same manner as that described for steel pipes.

With regard to the laying of pipes, the ideal method would be to lay the pipe so that it lies in a straight line from the point of inlet to the point of outlet. Such a line would lie exactly upon what is termed the hydraulic gradient (see line A.B. of sketch) and would require a lesser length of piping than would be necessitated by any other course, and in consequence the losses caused by friction are reduced to a minimum.

To lay a pipe line of any length upon the exact hydraulic gradient is in practice, well nigh impossible, owing to the usual undulatory nature of the ground between the inlet and outlet ends. The principal point to be borne in mind is to adhere to the hydraulic gradient line as closely as the natural topographical features of the route will permit, and if at all possible never to allow the pipe to rise above the hydraulic gradient line in the manner shown on sketch by the line A.C.D.B. The reason against such an alignment, is that the pressure along the hydraulic gradient in a pipe of uniform diameter is purely atmospheric and that any rise of the pipe line above this will cause a partial vacuum, and thus owing to reduced pressure the water will let free many of the air particles previously carried in solution, and the accumulation of these at the summit (D on sketch) will seriously interfere with the flow. When it is impossible to avoid a summit in the pipe line above the hydraulic gradient, an air vessel should be introduced with a tap. In the ordinary way owing to the water pressure at the summit being below atmospheric pressure, by opening the tap air would be let into the pipe through the air vessel, but by throttling the pipe near the air vessel the pressure in the pipe will be increased and the excess of air discharged through the tap when opened. Despite this and other methods for partially

obviating the defect of raising the pipes above the hydraulic gradient, it will almost invariably be found advisable to make a diversion or cutting so that the pipe line may be kept below this gradient.

Assuming that an alignment can be obtained below the hydraulic gradient as shown generally by the line A.E.F.G.H.B. on sketch, efforts should be made to keep this line as straight as possible, and all necessary changes of grade or alignment should be made gradual so that there be no sudden changes in the direction of the waters flow.

Any extra length of piping and every bend causes extra friction and a consequent loss of velocity in the pipe. Where a big change in the direction of the line has to be introduced, it will generally prove more economical in the long run to do so, by means of a series of gentle bends and short straight pieces, than by introducing one single acute bend, as by the former method, the change in the direction of flow of the water is more gradual.

Whenever possible the pipes should be laid underground, and covered by not less than 12 inches of earth to minimise expansion. The temperature of the earth at a depth of over 12 inches varies very slightly so that expansion joints should not be necessary, and in the case of household supply the water would be delivered at a fairly uniform and cool temperature.

In laying the pipes the trenching gang would be in front, after them the laying gang, then the jointing gang, and after them the filling gang. In a long length of pipes, where any pressure has to be withstood, the pipes and joints should be tested at intervals along their length to withstand a pressure of not less than double that to which they will be subjected under normal working conditions, before the trench and pipes are filled in.

The trench for receiving the pipes should be aligned carefully, and every change of gradient accurately laid out by means of boning rods, the use of which has been previously explained by the writer in his article "Hints on Irrigation: Small Gravitation Schemes"; Bulletin No. 64, pages 18 and 19. The pipes should be placed so far as possible on un-

moved ground and truly laid by means of a fine strong line, so that they adhere to the line and level determined upon.

Jointing steel or cast-iron pipes is generally done by means of inserting lead into a spigot and socket joint. The lead may be inserted hot, melted from soft pig lead and then well caulked up, or by caulking up cold lead fibre. In either case a strand of good white hempen spun yarn should first be inserted and well caulked, so that the lead cannot get into the pipes. In the case of a hot lead joint the lead if melted too cold will solidify before it has completely encircled the joint, and if too hot may burn through the yarn and find its way into the pipe. lead fibre is stuffed into the joint and caulked direct without requiring the application of heat. Hot lead joints require less labour in caulking, than cold lead-fibre joints and the writer is inclined to think that the former can be executed more expeditiously. The value of a cold lead-fibre joint is considerably enhanced, however, where the pipes have to be laid in water-logged ground.

In covering the pipes the softest material should first be thrown into the trench and carefully packed and rammed around the pipes in such a manner that no disturbance to them is caused, before the coarser material is replaced. This part of the work can be facilitated by the trenching gang throwing the soft material to one side of the trench and the coarser to the other.

Where pipes are laid across the beds of rivers, they should receive a capping of concrete to prevent their being injured by sand gravel and boulders passing over their unprotected surface.

On the pipe line A E F G H B scour valves will be required at the points E and G, to enable any debris which may collect in these depressions to be cleared out, and at the points F and H air valves will be necessary to permit of freeing these summits of any air that may accumulate. Air valves can be obtained which are automatic in their action, relying as they do upon a wooden ball valve which drops below the valve seat whenever air accumulates and is forced back into its seat by the water rising after the air has escaped. The scour valves are generally operated by hand,

and need only be opened about once a fortnight under ordinary circumstances, but by practical experience the frequency of this operation will readily be determined. At the pipe inlet a bell-mouth piece should be inserted, and in a delivery tank immediately above this, a grating should be fixed to prevent the passage of large stones, sticks and other obstacles into the pipe. This grating should be slightly inclined from the vertical towards the direction of flow, so that reeds, sticks, etc., may have a better chance of floating to the surface and not clogging the whole area of the grating. For the same reason the grating should be constructed of bars placed vertically. If placed horizontally or meshed they will facilitate clogging.

When laying large diameter steel or wrought iron pipe in water-logged ground, it should be noted that there will be a tendency for the pipes to rise when empty, and due precautions should be taken to prevent this.

Water being practically incompressible, stop-valves placed at the lower ends of a long length of pipe if suddenly closed causes what is known as water-hammer. The effect of suddenly checking the flow of a moving column of water is similar to the effect that would be caused by a railway train in motion colliding with an immovable object, and the strain on the valve pipes and joints may be very severe indeed. In a gravitation main one way to obviate this danger is to control the water at the inlet end, but when there are several branch outlets this is impossible, and the simplest way to control water hammer is to close the stop valves very slowly. In pumping mains water-hammer is set up by the reciprocation, pulsation, etc., of the pumps, and this can be neutralized by the provision of suitably dimensioned air-vessels. Air being compressible, these air-vessels act as buffers and take up the shock. Should a pump of any description from any cause suddenly stop work the column of water in the pumping main will immediately come to rest, and by doing so cause a certain amount of shock at the pump, to obviate this one or more back pressure valves should be introduced with an air-vessel on their up-stream side.

The following is a list of tools and implements which may be required in pipe-laying :—

Set shear legs.

Endless chain and block.

Rope slings.

Chain slings.

Length Manilla rope.

Round poles (for rolling heavy pipes).

Poles, with hook at one end (for off-loading).

Sets boning rods.

Shovels.

Picks and handles.

Mattocks.

Crow-bars.

Wooden and iron pegs (for setting out).

Lines (for lining and grading).

Ranging rods.

Stone-lifting clips or dogs.

Ramming beetles.

Composition (for re-coating pipes where damaged).

Heavy hammer and block (for driving pipes home).

Wooden levers.

Caulking chisels for yarn.

Do. do. for lead.

Batting chisels for lead.

Double-faced hammers ($2\frac{1}{2}$ lbs.).

Fire devil (for coal or wood).

Elastic jointing clips (for running hot lead joints).

Melting pots.

Ladles.

Puddled clay (for forming spout for clips).

Cold chisels (for cutting lead).

Rivetting hammers.

Testing pump.

Blind flanges for above.

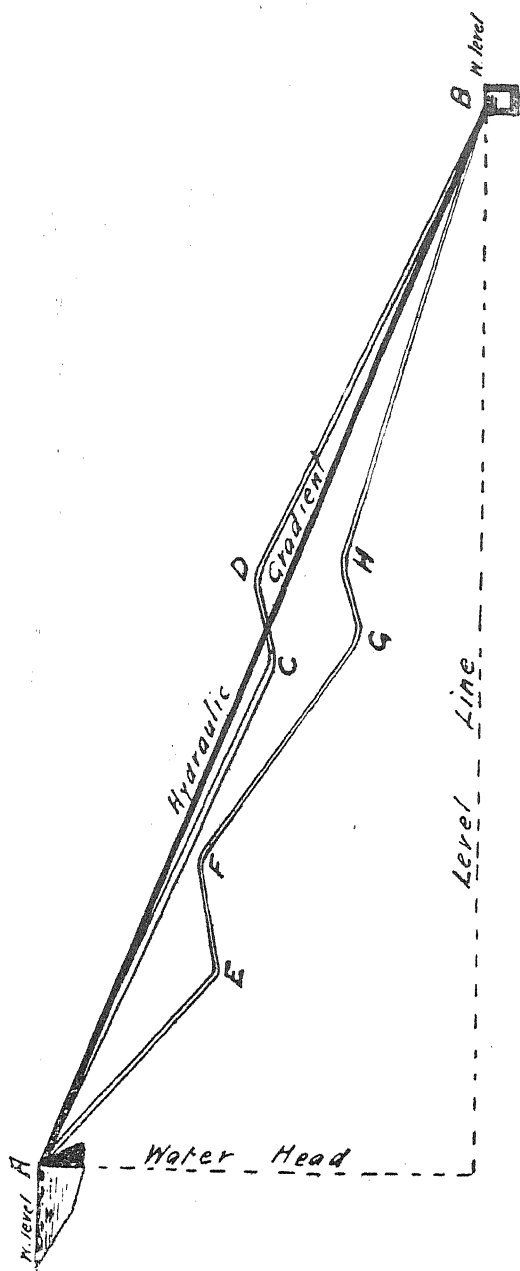


Diagram illustrating article on Pipes and Pipe Laying

A very common measure (*sic*) among farmers, is a pipe of water, *i.e.*, water is measured as being enough to flow through an 8 inch pipe, a 4 inch pipe, etc., etc. As the discharge of any pipe is dependent upon the velocity of the water through it, and as this velocity is chiefly dependent upon the head of water above the outlet end in relation to the length of the pipe, the above is no measure at all, unless the length of pipe and the head of water are given in conjunction with the diameter. For instance, an 8 inch diameter pipe with a head of 1 foot in a length of 100 feet would give a discharge of, in round numbers, about 500,000 gallons in 24 hours, while the same diameter and length of a pipe with a head of 4 feet would give about double this quantity. The formulæ for the discharge of pipes are empirical being based upon experiment and depending largely upon the value given to a co-efficient. The one generally accepted for straight pipes is: $V = C \sqrt{rs}$ where V is the velocity in feet per second, C a varying co-efficient, r the mean hydraulic radius (for circular pipes= $\frac{\text{diameter}}{4}$), and s the sine of the slope (*i.e.*, the head of water divided by the length of the pipe).

As the co-efficient is a varying quantity, this formula will be of little or no assistance to a farmer, but I shall at any time be pleased to work out the approximate discharge to be expected from a pipe line if any farmer cares to write me giving the following particulars:—(1) Kind and diameter of pipes used; (2) whether old or new, dirty or clean and how coated; (3) the length of pipe line; (4) the head of water (*i.e.*, the vertical height from the surface of the inlet water to the surface of the outlet water); (5) whether the pipe is fairly straight and if not the number and nature of the bends or other obstructions. Of the above (1), (3) and (4) are the most essential.

The following data may be of use:—

Area of pipe = diameter squared multiplied by 0.7854.

Discharge = mean velocity multiplied by area of pipe.

1 cubic ft. of water = 6.25 gallons (approx.).

1 cubic ft. of water weighs 62.5 lbs. (approx.).

4 Imperial gallons = 5 U.S.A. gallons.

Wrought Iron, 1 cubic inch weighs 0.278 lbs.

Cast Iron, 1 cubic inch weighs 0.260 lbs.

Steel, 1 cubic inch weighs 0.283 lbs.

Lead, 1 cubic inch weighs 0.412 lbs.

One acre of water, 1 ft. deep = 43,560 cubic feet.

One cubic ft. per sec. = 2 acre ft. in 24 hours (approx.).

One 4 inch watering per acre = $\frac{1}{3}$ of 1 acre ft.

One 4 inch watering per acre = 14,520 cubic feet.

The following might be of use as a Specification of works in connection with laying of water piping :—

The works under the contract include all that are necessary for laying a line pipe in—with bends, valves and other special pipes all to be laid to the lines, gradient and levels shown on the section drawing or as the necessities of the work require.

The Farmer will supply all the pipes, tee pieces, bends and other special pipes as also lead and yarn for packing, and cement for any concrete work required, and will have these carted as near as possible to that section of the pipe line on which they are required. The Farmer will also undertake to supply a set of sheer legs with block and tackle and one elastic jointing clip, with all other implements considered necessary for expeditiously and efficiently cutting and filling the trench, and for laying and jointing the pipes, valves, etc., etc.

The Contractor shall supply his own labour, dig the trench, lay and joint the pipes, valves and other specials, bed each valve in a concrete pit, and support the pipe line where necessary on concrete bases as may be required by the Engineer, refill track, remove surplus material, and do all work whatsoever connected with the laying of the pipes as described herein, or shown by the drawings, or included in the schedule of measurement, and such other things as may be necessary for the completion of the work.

LAYING OF PIPES, ETC.—The pipes to be used are of steel, inches diameter, with spigot and socket joints, and

no pipe shall be used unless approved by the farmer or his engineer, as fit and suitable for use. They shall be well and truly laid to line and level with rope yarn packing and afterwards run, caulked and batted with lead to a depth of about $1\frac{1}{2}$ inches. The piping shall be fitted with cast iron tee pieces, bends and other special pipes at the points shown on the drawing, or as may be pointed out by the Engineer. The joints must be able to withstand a pressure of lbs. per square inch, and no joint shall be made except under the supervision of some competent person duly appointed by the farmer for the purpose, and any defective joints must be made good by the contractor at his own expense. The contractor shall further render all reasonable assistance when such tests or other inspections of his work are made, by the engineer, inspector, or other person duly appointed for the purpose. Each valve shall be truly laid, and jointed by bolts and washers to the flange of tee piece, and bedded in a concrete pit, as may be found necessary. Such concrete work to be paid at the schedule rate, per cube yard laid.

CUTTING PIPES.—The farmer shall supply wherever possible sufficient short making up pieces, but the contractor shall at his own expense cut any pipes that may be required for the proper completion of the work to such dimensions as shall be pointed out by the engineer, and all such pipes shall be cut with a file or proper cutting machine, no hammering or chiselling on the pipe shall be allowed.

PIPE TRACK.—The trench shall be excavated to the depth shown on the drawing, or as may be altered by the engineer, as the exigencies of the work require, so that the pipes may be laid to their proper line, grade and level. At the joints of pipes the excavatton shall be of sufficient depth to admit of the pipes being properly laid and jointed, and the pipes shall rest throughout their length on unmoved ground. In cases of rock cutting in any part of the track the trench shall be cut 2 inches deeper than the intended level of the underside of the piping and this extra depth shall be filled in with soft material in which the pipes shall be bedded. Rock pieces for excavation shall be allowed only where the same is distinctly stratified and bedded, boulder stones being reckoned as soft.

The trench shall not be refilled or the pipes covered over until the laying, bedding, and jointing have been approved of by the Engineer. After such approval, the excavations shall be properly packed and rammed around the pipes, no hard substance being allowed to come in contact with them and the trench shall be properly filled, the whole material being well beaten and rammed, and care taken not to injure or disturb the pipes in any way by such operations. Any injury or disturbance caused to the pipes shall be made good by the Contractor at his own expense.

In crossing under or over any furrow or artificial water course the water shall be diverted if necessary, by the farmer but the Contractor must restore same to its original state.

In crossing under a river, the water course shall be temporarily diverted by the Contractor at his own expense until the pipes are truly laid in their position, and properly jointed, after which it shall be restored to its original course. Should it be found necessary after excavation in the bed of the river, the Contractor shall support the pipes on concrete bases at whatever points and in such manner as may be pointed out by the Engineer, such extra concrete work shall be charged at the special schedule rate per cube yard laid, all cement, timber and implements necessary being supplied by the farmer.

In carrying the pipes under the service road, the work shall be done by the Contractor so as not to interfere with the use of the road or the traffic thereon, and the roadway shall in all respects be restored at his own expense to as good condition as it was before being interfered with, and that to the satisfaction of the owner. Should the pipe track by reason of any deviation from the line shown on the drawing, deemed necessary by the Engineer, at any part rise above the ground surface, the pipes for these parts shall be given a bed on a layer of selected material to be approved of by the Engineer, well beaten and rammed to the proper level of the underside of the pipe, and if necessary on concrete bases, and after the pipes have been laid and jointed and the work duly approved of as aforesaid, the pipes shall be covered over by an embankment of suitable material well beaten and rammed, such covering to be not less than 12 inches over the pipe all ways.

All concrete used in the work shall consist of one part of Portland cement to two parts of clean sharp river sand and three parts of hard clean stone or gravel. The farmer undertakes to supply the cement and all tools, implements and timber, necessary for mixing and laying. The Contractor shall obtain the sand, stone or gravel at such points adjacent to the work as may be pointed out to him by the farmer. The respective parts of the concrete shall be carefully measured and mixed, and turned over twice when dry, watered with a hose and then turned over twice on clean boards.

DAMAGES.—The Contractor shall be responsible for all accident or damage caused by his operations and shall relieve the farmer from all claims arising in connection therewith.

TIME FOR CONSTRUCTION.—The works shall be commenced within — days from date of acceptance of offer and shall be completed within — weeks from date of acceptance of offer.

MAINTENANCE.—The Contractor shall maintain the whole works in efficient order for a period of one month after they are certified as complete and during that time shall at his own expense make good any defects that may arise, and shall at the end of the period of maintenance leave everything in good and perfect order.

OFFER.—The Contractor shall offer to execute and complete the whole works for a lump sum, and, in addition thereto, shall fill up the attached schedule, the prices in which shall regulate the payments for any additional work or the deductions for any works that may be dispensed with.

PAYMENT.—Payment shall be made to account fortnightly under deduction of 10%, to be retained in hand as security for the due completion and maintenance, and at the end of the period of maintenance the balance, without interest, shall be paid.

The measurements given in the schedule are only approximate, and payment will be made at the schedule rate on a measurement of the work as actually completed.

SCHEDULE OF QUANTITIES.

DESCRIPTION.	QUANTITY.	RATE.	AMOUNT.
	Lin. yds.		
Cutting and filling trench in soft material to an average depth of — inches			
	Lin. yds.		
Cutting and filling trench in rocky ground to an average depth at — inches			
	Lin. yds.		
Banking for pipe (if any) average height to underside of pipe — foot.			
	Joints.		
Laying and jointing — yards of steel pipes, C.I.T. pieces and bends, etc., per joint			
	No.		
Jointing and bedding stop valves			
	Cub. yds.		
Forming concrete bases for crossing of river (if any)			
	Cub. yds.		
Making concrete supports for other portions of pipe line (if any) ...			
	No.		
Extra for crossing under river			
Extra for crossing under service road			
Extra for crossing under furrows			
Extra for crossing over furrows			
Maintenance for one month			

Tender for works in connection with laying water pipes.

Sir,

_____ hereby offer to execute the whole works in so far as stipulated by the specification, or by the schedule, and in complete accordance with the same, and the relative drawings, for the lump sum of _____

including maintenance of the works, and _____ hereby agree that all additions to or deductions from the works shall be valued at the rates in the schedule, and that such amounts shall be added to, or deducted from the lump sum, as the case may be.

Your acceptance of this offer will be binding on

Your obedient servant,

Signature, _____

Address, _____

Date, _____

Pig Breeding and Feeding.

By T. M. RIXON.

Now that bacon factories are very much to the fore, it is possible that my experience in the breeding and raising of pigs for the last fifteen years in this country may be of some help to other farmers.

I have kept white pigs for the last twelve years, which are bred from an imported Yorkshire Boar crossed with white Colonial sows. Previous to these I had black and black and red pigs, but what breed they were would puzzle, I think, even Professor Douglas. It is said that white pigs are burnt by the sun in this country, which I grant is so if they are allowed to run wild, but I have found if they are kept in small camps with some shade and access to water that they do not burn any more than black pigs.

I tried herding my pigs in the day and kraaling at night, giving them mealies in the kraal, but it was anything but a success, as the distances they covered in search of food made them more like greyhounds than pigs. I do not say that this applies to all the country, as in some parts of Mashonaland pigs will do well in vleis, but I think even these should be fenced off into small camps, so that they can be fed off in rotation. My plan for some years now has been to keep my pigs in styes which open on to a stone kraal about 50 yards square, which has an open shed and a cement bath, 6ft. x 4ft. and 3ft. deep, and is kept about half-full of water. The pigs sleep in the styes at night and are fed there night and morning, but in the day the growing pigs run in the kraal and green food is fed to them there. By this means a lot of manure is saved which otherwise would be lost if the pigs were herded. The boar should not be allowed to run with the sows, as is so often done in this country, but kept in a sty by himself some distance away from the pig kraal and the sows taken to him.

The young sows should be at least eight months old before they are put to the boar. The degeneration of our pigs is largely due, I think, to breeding from immature sows; rather lose a few months and let the sow fill out than spoil both her and her young. Another reason, I think, that our pigs do not develop so quickly as they might is the very simple one that we do not feed them enough in the growing stage.

When I have been short of bulky food for my growing pigs and they have got down in condition, it has given them a check which they never recover from, and by the time they are fat they have cost more than they should fetch.

Every farmer should make up his mind how many pigs he means to keep and grow food accordingly, and not chance what food comes along. By bulky food I mean mangels, pumpkins, sweet potatoes, kafir melon (majoda), lucerne, green barley, small potatoes, etc.

I grow two crops of mangels, one of which is planted in November and grows with the rains and is fed in May, and the other in February which has water led to it generally twice, in May and June. These later mangels remain on the ground until August, when they are pulled and stored, and keep good until November. Mangels, I have found, give the heaviest yield of any pig food I have grown, and keep well.

Pumpkins, the pigs do very well on, and are very fond of, but they are rather an uncertain crop, as some years they get badly stung. The best kind is the large cheese, which are very solid and good keepers. The kafir melon (majoda) is also an excellent bulky food and gives a heavy yield, growing on light soils, which are on the poor side. I have had them weighing 40 or 50 lbs, and if stored off the ground in a shady place they will keep up to October and even later. I think every farmer should try them, as they are relished by all kinds of stock. In the winter I also feed barley and lucerne to the pigs.

I also have a large boiler, and all wash from the kitchen, cabbage leaves, old turnips, carrots, etc., from the garden, together with small potatoes and anything else which is

going, are all boiled up together each day, and it is wonderful what a lot of pig food can be collected in this way. It pays to make it one boy's work to look after the pigs only, and not to leave the feeding to any boy that may chance to be about. Let him feed the pigs first thing in the morning and then clean the styes out, and after that collect all the odds and ends to be cooked in the boiler for next day. Once a day my growing pigs and sows get a small ration of mealies and kafir-corn, which is ground and fed to them dry.

When the pigs are large enough to fatten they are kept up in styes and finished off with mealie and kafir-corn meal, separated milk and pumpkins and as much fed to them at each meal as they will eat.

Pigs in this country are troubled by a number of vermin pests, lice, fleas, etc., and should be sprayed at least every two weeks. I generally use one of the carbolic dips and spray them in the styes before letting them out in the morning. Once a month also the styes are sprayed out with lime wash and some dip mixed with it.

Bean Crops.

A lecture delivered before the Headlands
Farmers' Association

By H. GODFREY MUNDY, F.L.S.,
Government Agriculturist and Botanist.

At the request of your Association I am here to-day to place before you a few facts regarding bean crops in Rhodesia. Time will not permit of my dealing with the subject at any great length, but I believe that most of you are acquainted with the general methods of growing and handling this crop, which if it is to fulfill its most useful function in the scheme of scientific farming must be regarded primarily as a rotation crop for the maintenance of soil fertility.

For our purpose to-day we may divide bean crops into two classes, namely, those which are grown for human consumption and those used for stock feed or for soil renovation. The cultivation of green beans for fresh vegetables falls within the purview of the nursery gardener, and since we are now dealing with beans as a farm crop we may disregard this aspect.

You may comment on the fact that I have indirectly inferred that the bean grown for human consumption is not a soil renovator, but this is in the main part correct. When speaking of beans for human consumption, I refer in particular to those of the following types:—Canadian Wonder, White Haricot and Sugar Beans—there are many sub-varieties of these, but the above named are those most commonly grown in South Africa. In my experience, and I have examined a large number of bean crops in Rhodesia and elsewhere, it is the rare exception rather than the rule for beans of this type to produce nodules on the roots, more particularly when grown on other than rich black soil.

You are probably aware that where the necessary bacteria are present in the soil leguminose crops, such as beans, peas and clover, have the power of absorbing free nitrogen from the atmosphere. These bacteria set up a local irritation and form excrescences known as nodules on the roots of the plant. In these nodules the bacteria dwell, and in the process of their existence they store up in the excrescences the nitrogen which they have assimilated from the air. Finally the bacteria and the nodules break down and become disorganised, and the nitrogen they contain is available for the use of the plant and for the succeeding crop. The leaves and stem of a leguminous plant contain a greater amount of nitrogen than do similar parts of a straw crop such as wheat or maize, but by far the greater amount is stored in the nodules when these are present.

As far as the maintenance of soil fertility is concerned, therefore, the best results are to be expected when the entire plant bearing nodules is ploughed into the ground. A smaller amount of nitrogen is imparted to the soil if a crop which has produced nodules, is pulled or cut and carried off the land, since in this case a certain number of roots with the nodules attached are left in the soil. It follows that still less benefit accrues to the land when a bean crop which has not produced nodules is treated in the last named manner.

In reaping a bean crop for seed, a common practice is to pull the entire plant from the ground and cart it away to the threshing floor, and where the plants have not carried nodules this will account for the statement often heard that bean crops in Rhodesia do not act as soil renovators. As has been stated, the beans used for human consumption very seldom produce nodules in Rhodesia, but to this rule the Kafir Bean or Cowpea, which is largely used by the natives for food, is an important exception. It appears that the Kafir Bean will produce nodules in this country on any soil in which the crop will grow. I have never examined one of these plants without finding nodules, even in cases where the growth of the plant has been extremely poor.

As field crops for producing dry beans, bush varieties are grown almost entirely and the White Haricot; the Canadian

Wonder, and Sugar Beans all fall under this category. Experiments conducted in Rhodesia indicate that the two first named are reliable croppers, and in trials carried out last season on the Salisbury Experiment Station the yield of these two kinds on unmanured land was at the rate of five bags (200 lbs.) per acre. Sugar Beans appear to be lighter croppers, and as a rule the yield does not exceed four bags per acre, though where the land has been heavily manured far larger crops have been recorded. All these kinds ripen fairly evenly—a very important point, and require from three to four and a half months to mature. Speaking generally the White Haricot is the most profitable kind to grow for sale, but has the disadvantage that the pods and seeds are much smaller than those of the Canadian Wonder, and the crop is therefore more difficult to handle. Sugar Beans do not seem well suited to local conditions, and except where they command an enhanced price I do not think this type is to be recommended. Fuller knowledge of the subject may make it necessary to amend these views, and this season extensive bean variety trials have been provided for on the Botanical Experiment Station.

There are several varieties of Kafir Bean and Cowpea—some of these are practically prostrate, while others approach more nearly to the bush type. The great objection to the Kafir Bean, however, is that it has no fixed period of growth, and as long as weather conditions remain favourable the plants will continue to flower and set seed. This entails uneven ripening, and the crop must either be picked over for seed several times, or the plants must be pulled or cut at an intermediate stage when unripe, ripe and over ripe pods, which have shed seed, are present.

CULTIVATION OF FIELD BEANS.—Almost all bean crops grow best on a well drained clay loam or gravelly loam of moderate fertility. Wet soils are unsuitable, and when planting on land of this character the seed should be sown on ridges. On excessively rich or peaty soils the plants are inclined to make too much leaf growth at the expense of pods. On soil of moderate fertility and with varieties which may be expected to produce nodules, manure is not necessary, but on sandy soils or where nodules are not

likely to be produced, a dressing of about six tons of kraal manure per acre is one of the best fertilisers. Potash and lime can with advantage be supplied by an application of wood ashes, and where possible about 100 lbs. of superphosphate per acre drilled in the rows is desirable. Experience indicates that in Rhodesia with Haricot, Canadian Wonder, and Sugar Beans manuring is advantageous, but with the other types of beans I do not think that at present it can be advocated.

SOWING.—Seed should not be sown until the soil is warm, and time of seeding should be regulated so that the crop will mature towards the close of the rainy season. Beetles often cause considerable damage to small crops by devouring the flowers before seed has set, and some farmers have endeavoured to avoid this either by early or late planting. It is, however, the small patches which suffer most, and where a moderately large acreage is planted, the injury by beetles does not usually seem very serious. As a further protection, however, the bean field may with advantage be situated in and surrounded by the maize lands. The seed should be drilled in rows from two to three-and-a-half feet apart, and from six inches to two-and-a-half feet apart in the rows according to the variety. The cultivation of the crop is much the same as for maize except that the harrow cannot as a rule be used. Frequent stirring of the soil between the rows to keep down weeds and to maintain a soil mulch is very necessary.

HARVESTING.—When the pods are ripe, Bush Beans are usually pulled by hand, but ploughs which will cut the tap root just below the surface are often utilised, and a wing shovel plough with a sharp shear might probably be used for this purpose. In Rhodesia the plants, after pulling, are usually carted to a drying floor, but where large crops are grown they can be raked into wind-rows and then heaped around upright stakes or on piles of brush wood until quite dry. Threshing is usually done by hand by means of flails, though threshing machines with special concaves are in use in America. After threshing, the next process is winnowing or, failing this, the beans should be picked over by hand, and they are then ready for market.

MARKETS.—In deciding what bean crop to grow, one of the first considerations is the question of markets. Salisbury produce merchants state that natives always prefer Kafir Beans rather even than the best White Haricot Beans, and Red Canadian Wonder Beans are unpopular owing to their colour. For the European trade, however, a white bean is essential and the White Haricot is the best. The consumption of beans by the European population of Southern Rhodesia is comparatively small however, and the mines offer a much wider market. For this purpose local supplies are seldom if ever equal to the demand, and during the past season large quantities of beans, often of inferior quality, have been imported from Portuguese territory and elsewhere.

The selling price of beans fluctuates considerably, and it is difficult to arrive at a fair average price. Beans of the Canadian Wonder and White Haricot type appear to command about 25s. to 30s. per bag, while the Kafir Bean may be said to average from 20s. to 25s. per bag. Recently prices have been higher, and occasionally not more than 15s. to 18s. per bag is realised.

The Kimberley Mines afford a large market for beans, the buying price for Sugar Beans averages about 24s. to 26s. per bag and for Kafir Beans from 15s. to 27s. 6d. per bag. The railage from Salisbury to Kimberley on fifteen ton lots amounts to 2s. 1½d. per bag, and unless production is on a sufficiently large scale to permit of consigning in these quantities this market would not be a profitable one for Rhodesian farmers.

Up to the present the majority of farmers have confined their efforts to growing a few acres of beans with a resulting total crop of twenty or thirty bags. The reason for this is the labour of handling the crop, and the fact that it is sometimes considered a risky one to grow, but there is little doubt that where sufficient labour is available the crop is a very profitable one, and those varieties which form nodules and therefore enrich the soil should take a forward place in the rotation of every Rhodesian agricultural farm.

From the point of view of a marketable bean crop which can be handled with a minimum of labour, it seems therefore that either the Haricot or the Canadian Wonder are the most profitable under Rhodesian conditions, particularly where the crop can be manured. If a rotation crop is required, which will at the same time act as a soil renovator, then one of the bush types of Kafir Bean or Cowpea is infinitely preferable. As has been pointed out the labour of harvesting these is greater, but on the other hand the market for this type is more extensive than for the better class of bean, and in practice there is no great difference in their market worth.

Referring again to the formation of nodules on the roots of beans grown on black soil, it must be pointed out that land of this character is usually rich in organic matter and nitrogen, and does not, therefore, require additional supplies of these to the same extent as do light red or sandy soils. Kafir Beans and Cowpeas will produce good crops on the latter types of soil and by the formation of nodules will increase the supplies of available nitrogen, and thereby enhance the fertility.

If the crop is to be grown for fodder no bean will give a heavier acre yield than the Velvet Bean, and experiments conducted in Rhodesia indicate that on all classes of soil this crop can be relied upon with practical certainty. When the crop is grown with the object of pasturing pigs, any variety of the Kafir Bean or Cowpea can be recommended on account of the greater yield of seed, which is of importance in pig feeding, and since the latter usually produces nodules more freely than the Velvet Bean it is the more valuable for soil renovation.

A lecture on bean crops would not be complete without some reference to Soy Beans, which, within the last few years have become such an important economic product. An article dealing with this crop, however, appeared in the last issue of the AGRICULTURAL JOURNAL, and since the initial experiments with Soy Beans in Rhodesia have thus far met with but moderate success, it is necessary to await the result of further investigation before any definite recommendations can be made.

To summarise :—*a.* The White Haricot is the most suitable bean to grow for the European trade.

b. The Canadian Wonder is usually a slightly heavier cropper, and a trifle quicker in maturing.

c. The above types of bean are better grown on manured land since a light crop of 2 or 3 bags per acre will hardly pay for the cost of production.

d. If a crop is required which will produce a marketable bean, and will at the same time increase the soil fertility, bush types of Kafir Bean or Cowpea can be recommended.

e. These are more costly to handle, but this is recompensed by their twofold utility.

Paspalum Dilatatum.

By B. A. BLAND, Thornville, Shangani.

In the following notes I should like to place before readers of the AGRICULTURAL JOURNAL my experience with Paspalum Grass, in the hope that it may perhaps be of value to my fellow farmers in other parts of Rhodesia.

Four years ago we put in one pound of seed in a seed bed, but this germinated badly, and only about a dozen plants resulted. These, however, stooled out very quickly, and I was able to plant out nearly 2,000 plants the next season. I made the mistake of planting the slips too far apart (about 3ft to 3ft. 6in.), consequently they have taken a long time to join up, in fact in places they have not done so yet.

Being close to a land always under cultivation, my cattle never got on to the grass during the Summer months or during seeding time so as to tramp down any of the seed, and, moreover, the spaces being small between the rows, I have not been able to cultivate. For this reason the ground was soon overrun by twitch grass, which, as everyone knows will choke out any other plant, even the hardiest of veld grasses, but it has had no effect on the Paspalum. Instead of being choked it is steadily making headway.

Below this plot, where the floods have washed the seed, quite a number of plants (self sown) are now showing, especially in the wagon roads and cattle tracks, and the plants in the wagon road, in spite of it being a good deal used, have not been damaged by the traffic.

I therefore think that if cattle were allowed to graze and trample down the seed during the wet weather that it would spread very quickly, and I also think that cattle eating ripe seed will leave it in their droppings, and under favourable conditions, such as dropping close to water, or on damp ground, will germinate, at least this is the only way I can account for a patch far above any of my plots or seed beds, finding its way to a patch of damp ground. As this ground

was rather valuable soil, I thought I would remove the grass, and took out every plant last year, but to my surprise there are now patches as thick as ordinary veld grass, which have quite taken possession of nearly half an acre. I may mention that this patch is nothing less than a swamp during the summer, so soft that one can hardly walk through it.

Last October I planted out about 16,000 plants, putting the rows about 3ft. apart, but the plants about a foot apart in the rows. These have already joined up in the rows, and early this year I top-dressed a couple of pounds of seed in not too well worked ground. This has germinated very well, and I expect, therefore, to have a very thick stand this season.

In spite of all the severe frosts we have had this winter the Paspalum was only slightly touched—perhaps a large stool might have some of the top blades nipped, but underneath it was quite green. The shorter the grass the better it seemed to resist frost. Paspalum is quick growing when fed off, and it will be out from an inch to two inches again a week after grazing. The patch in the swamp was burned off about three weeks ago, and the grass is a good two inches ahead of the ordinary veld grass already.

I have all my Paspalum on heavy black soil, and it seems that it must have a soil that contains a little moisture during winter for it to do at all well, and, as I pointed out above, it will do best in a swamp where it seems to have resisted frost even better than on the dryer black soil.

[When visiting Mr. Bland's farm during the middle of August, and when severe frosts were of nightly occurrence, I found his Paspalum in excellent condition, and with sufficient green growth on it to afford excellent grazing. I would point out, however, that in other districts this grass is doing very well on much drier soils.—GOVT. AGRICULTURIST AND BOTANIST.]

Preliminary Notes on the Habits of the Common Tsetse.

By RUPERT W. JACK, F.E.S., Government Entomologist.

The original description of *Glossina morsitans* Westw., the species of fly to which the name "Tsetse" is most properly applied, dates as far back as 1850, and there is at least one traveller's reference to a fly whose bite was reported to be fatal to stock, nearly forty years previous to this (Austen). Gordon Cumming's notes on the insect in 1850, which brought the name "Tsetse" before the public, have been followed by plentiful descriptions of the appearance of the fly, its habits, and the effect of its "bite" on stock, so much so that some have even expressed the opinion, that the subject has become exhausted. The pressing nature of the "fly" problem in Southern Rhodesia of late years, has caused the officials concerned to search critically the published records concerning the habits of the species, with a view to finding information that might be of value in suggesting some means of combating the pest. The conclusion was then quickly reached that the available notes on the bionomics of the insect were of a very meagre and often contradictory nature, and quite inadequate for economic purposes, whilst of the breeding habits absolutely nothing was known, beyond, as was supposed, the fact of the production by the female of a single full-grown maggot at a birth, and that this maggot after a few hours of activity changed to a pupa (chrysalis), from which, after a certain time the "fly" emerged. This supposed knowledge was due to the work of Colonel (now Sir) David Bruce in Zululand, whose two reports appeared in 1895 and 1897 respectively. It is now certain that Sir David Bruce was working with an allied species, namely *Glossina pallidipes*, Austen, and not with *G. morsitans*, Westw., as was thought. As a matter of fact, there is no recorded observation of the extrusion of the young of the common Tsetse, but

as all the allied species that have been observed produce full grown maggots, it is practically certain that *G. morsitans* does the same.

The writer began investigations into the bionomics of the "fly" in Southern Rhodesia in 1909, in the Hartley district, but after a year's constant observations, it became evident that the "fly" was not abundant enough for substantial progress to be made. Since then the work has been carried further afield into the districts of Lomagundi, Mafungabusi, and Sebungwe where the "fly" is more abundant in its natural haunts. A quantity of notes have accumulated on the general habits of the "fly," and the attempts to ascertain its natural breeding grounds, have been successful to a large extent. It is felt, therefore, that the time has arrived to place the information that has been gained before the public in the form of Preliminary Notes, which it is hoped to supplement later as the investigations proceed. Unless otherwise made clear in the text, any statement that appears in this article is the result of the writer's personal observations.

APPEARANCE OF THE ADULT FLY.—Illustrations and descriptions of the "fly" have appeared more than once in this Journal, so it has not been thought necessary to repeat them here. (See August, 1909, and April, 1910.) *Glossina morsitans* is the only Tsetse with which we have to deal in Southern Rhodesia, and henceforward in these notes the name Tsetse, unless otherwise stated, may be taken as referring to that species.

FEEDING HABITS.—The Tsetse is a particularly alert and active fly. It darts straight to its resting place with none of the preliminary hovering that is associated with the larger *Tabanidae* (*Hippo flies*). If its resting place be the skin of an animal or human being and its object food, it rests for some moments, ready to dart away at the first sign of molestation. If satisfied that there is no immediate danger it will commence to feed, often shifting its feet for a moment as if to settle them comfortably. The actual beak is like a very fine bristle, the broader projection, shewn in the illustrations, being composed of the beak and its sheath, *i.e.*, the two palpi which protect it when not in use. For the purpose of sucking blood the beak only is lowered to a more or less vertical position, the palpi remaining in their place. The immediate

effect of the insertion of the proboscis varies greatly, probably in accordance with the point striking a nerve or not. The writer has watched a Tsetse on his arm from the time it settled to the time it left engorged with blood, and was unable to detect its presence by sensation at all, even when he saw the beak inserted in to the skin. At other times the prick will cause the victim to start as sharply as if a hot needle had been inserted. The after effects of the bite may vary with individuals, but personally speaking the hundreds of "bites" received have never left any traces at all.

In the very hot weather, as in October and November, the Tsetse was found to be most eager for blood up to about 8 a.m., and after 4 p.m., being little troublesome during the heat of the day. This was in the low veld below the Escarpment in Lomagundi, where the heat of the day at this season is intense. In cooler weather the "flies" may feed freely nearly all day. After a frosty night, they do not as a rule become very active till a couple of hours after sunrise. The "fly" evidently requires a mild temperature for its greatest activity. During strong cold winds it seems to leave cover very reluctantly. That the "fly" will sometimes bite on warm nights cannot be doubted. The writer has had specimens settle on him long after dark, but has not yet been bitten much after sunset. The usual presence of the camp fire may, however, have had the effect of keeping the flies away to a large extent.

FLY BELTS.—It has long been known that the Tsetse frequents only certain tracts of country, leaving other parts free, so that a hunter or transport rider with local knowledge can often make his way round and between these so-called "fly-belts" and so keep his beasts from being fly-struck. The sharp demarcation of many of these belts has often been insisted upon, leading to the belief that there must be some physical or other feature to account for the "fly's" strong predilection for that particular strip of country.

The sharpness of the limits of the fly-belts depends largely upon the season of the year, the "fly" being far more generally distributed over the veld during and immediately after the rains than during the dry season. Thus, below the Escarpment in Lomagundi, which is really in the valley of the Zambesi although some seventy miles from the river,

during October and November, 1910, the "fly" was found to be practically confined to the shady banks of the dry rivers and the shady borders of vleis, the bush generally being destitute of foliage at that season. In the same part in April, 1911, when all the trees were in leaf and shady, the "fly" was distributed generally throughout the veld, though possibly most abundant in the Mopani belts. In the rolling Msassa and Mfuti Forests near Tchetchenini Hill, the "fly" was also generally distributed in April. The elevation here is higher than in the Zambesi Valley. Near the Umniati and Sakugwe Rivers in December, 1910, after the opening of the rains, the "fly" was generally distributed, the trees being everywhere in leaf. In August, 1911, in Sebungwe, east of Kariyangwe, the "fly" was confined to the shady borders of rivers and vleis. In the Hartley district for several years past the "fly" disease broke out each year on certain farms in February and March, the cattle being quite healthy during the remainder of the year. As already stated, the "fly" is small in numbers in the Hartley district so that observations on distribution there have not the same value as in better populated "fly-areas." However, notes were made on the Suri-suri belt nearly every month of the year 1909-10, and no "fly" was seen within three miles of the nearest affected farm until February, when one was taken on the border of this farm. An occasional "fly" was caught in the Mfuti and Msassa bush during February, but during the dry season all the specimens were taken close to rivers and pools (dry and otherwise) where the trees afforded shade. The daily catch, however, rarely exceeded half-a-dozen. The great haunt of the "fly" in the dry weather is some three or four miles from the nearest farm. All the available evidence thus points to the fact that the farms were free from Tsetse until the rains, during which the "fly" spread across from its winter haunts.

It may be mentioned that the abundant presence of water, even when not visible on the surface, in the first place encourages the growth of trees different in species from the remainder of the bush, and in the second, seems to exert a remarkable influence in keeping such trees as the Mfuti and Msassa in leaf, when the same species in drier situations are quite leafless, so that a river, pool or vlei though dry on the

surface in winter will commonly be surrounded by shady trees and thus form a suitable environment for the "fly." In entering a shady part in the bush in a "fly area," when the bulk of the bush is leafless, one is apt to be suddenly attacked by dozens of Tsetse flies, hardly any having been noticed previously. As the vast bulk of the notes have been made by hunters who travel chiefly in the dry season, this phenomenon may have given rise to the opinion that a "fly-belt" is a very sharply defined thing. The writer's experience is at variance with this as a general statement unless there be some strong physical feature to account for it, as at the Escarpment in Lomagundi, where the ground suddenly descends about 2,000 feet to the Zambesi Valley. No "fly" is found above the Escarpment here, but is plentiful enough as soon as the level ground below is reached.

In Southern Rhodesia the Tsetse is not known to occur at an elevation of over 4,000 feet, though it approaches that height near the railway in the Hartley district. The freedom from "fly" of a large part of Southern Rhodesia may therefore be attributed to the combination of elevation and latitude. It is, however, not so easy to account for the fact that some parts of the country are infested with "fly," whilst other parts similar in elevation and vegetation are free. In carrying out investigations it is very difficult to make effective comparisons between infested and non-infested country because much of the non-infested country has been infested in the past, and although free at the present time, is nevertheless potential "fly area." It must be borne in mind, however, that the Tsetse fly, compared with most other Diptera, is a very slow breeder and so not in a position to extend its range with great rapidity. Thus should unfavourable conditions or the attacks of some enemy exterminate it in a certain tract of country, it might be years before, with the re-appearance of favourable conditions, it regained its old haunts. In this connection it is interesting to note that in the Sebungwe district there can be little doubt as white and native testimony both agree on the point that the Tsetse was formerly abundant about the junctions of the Mzola and Kana rivers with the Shangani, and that, whatever the cause may have been, it disappeared from there about the time of the Rinderpest; the fly area contracting

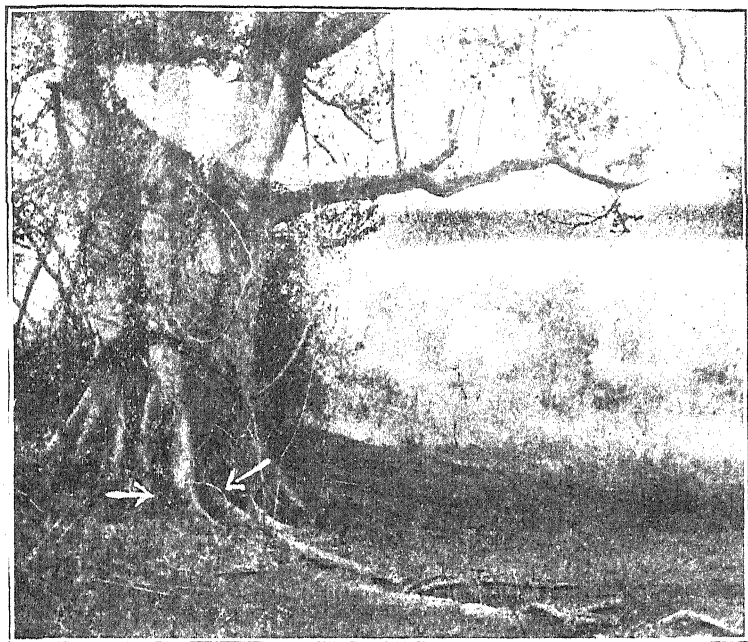


Plate I. Fig. 1.



Fig. 2,

far to the North-east. There is no doubt that of late years the "fly" has been spreading South and West again, but its progress is exceedingly slow, and although there is no noticeable barrier of any sort to stop it, it has not yet reached these rivers again. Food is abundant enough there, that part being one of the best stocked game areas in a district as little affected by the white man as any in Southern Rhodesia. This country although with scarcely a doubt a potential "fly area" has, according to all testimony, been free from "fly" since 1896-7.

Whilst on the subject of the spread of the fly a few words about its habit of following a food supply will not be out of place. For flies to be carried on natives for three or four miles in some numbers is not an uncommon thing, and on one occasion I saw a specimen carried on a native walking in front of me for seven miles. Flies carried in this way, whether they obtain a feed or not, begin to leave after a little until at length the last one is gone. What becomes of them? In the case mentioned above the specimens were carried out of a "fly-area" into fly-free country, and as natives frequently pass along this path in parties a number must be so carried during the year in that particular locality, and the same thing must happen with other fly areas in different parts of the country, not only with natives but with the game. Now, were it the usual thing for these individuals to remain in the part to which they are carried and, providing it is favourable for them, to reproduce their species there successfully the spread of the "fly" would under favourable conditions be quite rapid, which it certainly is not. They must, therefore, either remain and generally fail to establish the species or they must return to the area whence they were carried. When one considers how the fly must be spread about by the movement of herds of game as well as natives, it is quite obvious that the continuance of the species in certain areas must depend upon the return of the scattered members to the common haunt. (It is perhaps difficult to conceive of a "fly" making its way back through seven miles of forest, but this is probably an exceptional distance, for game as a rule does not move with the speed and directness of a party of men on the march; elephant and buffalo are, of course, known to

cover big distances in a day, and probably other game do also when seeking fresh feeding grounds; such movements, however, occur chiefly at certain seasons). As an instance of "fly" leaving a spot to which it was carried in some numbers, on the Umniati River in December, 1910, we travelled southward along the west bank of the river, and one day, after crossing about three miles of rough country, we breakfasted in some big timber quite close to the bank of the river. The fly which had accompanied us was very troublesome there, biting greedily, and there must have been a score or so about. We moved about five miles further South, and on outspanning, one fly was caught in the tent, and another seen. Finding and hearing of no "fly" here, we stopped one day only, and returned Northward. We did not see a single fly at the place where we had breakfasted on the way down, and the natives at a neighbouring kraal said there were none about. As a matter of fact we did not encounter "fly" again until we had recrossed the three miles of rough ground. There is therefore an instinct in the Tsetse which causes it to return to its old haunts, or to the company of numbers of its own species, and this instinct is doubtless the outcome of the slow rate of increase, a single pregnant female producing single young, at fortnightly intervals, being quite unable to establish a colony in a fly-free area, and the survival of the maximum number of individuals being necessary, to counteract the paucity of the young. It follows then, that as a rule the spread of the "fly" must take place as the result of the pressure of numbers within the infested area causing an advance along favourable channels, the occupation of new ground being generally brought about by a considerable number of individuals, and not by isolated or even two or three females being carried to a distance. If this reasoning is correct, one can understand why "fly" does not occur everywhere where suitable climate, shade, food, and suitable breeding places are to be found, the tendency of the Tsetse being centripetal rather than centrifugal, i.e. its numbers are concentrated from the motive of the preservation of the species, and are not scattered through all the suitable country that exists for it.

The Tsetse does not seem to be confined to any particular *geological formation*. The affected farms in the Hartley dis-

tract are on a rich red soil, probably of dioritic origin. Near the Umniati shales and fine sandstones, with quantities of quartz in places predominate. In the Zambesi valley, east of the Hunyani river, the soil is largely of alluvial origin, the Escarpment itself being composed mostly of micaceous schists. North-east of the Tchetchenini Hills the rock seems to be mostly granite. In the Sebungwe "fly area" sandstone occurs almost exclusively at the parts visited.

The *physical features* of the belts are also variable. Near Hartley, near the Umniati river, and in the Zambesi Valley the belts occupy very flat country, though "fly" does occur in the hills near the Umniati River. North-east of Tchetchenini Hill in Lomagundi, and East of Kariyangwe in Sebungwe the country is very hilly. In the Zambesi Valley the "fly" avoids the actual banks of the Hunyani River, though found about a mile to the East. On the Umniati in December it was moderately plentiful in places, right up to the Western bank of the river.

No distinct type of *vegetation* characterises a "fly belt". In all the belts visited the open forest occurs, (such as is termed Gusu by the Matabele). This consists of well grown trees, mostly Mfuti, (*Brachystegia* sp) Msassa, (*Brachystegia Randii*), or Mtondo, (*Brachystegia appendiculata*), with but little undergrowth. The Mopani (*Copaifera mopani*) belts are favourite resorts when the trees are in leaf. The difference in the vegetation bordering rivers and vleis has already been mentioned. North-east of Tchetchenini Hill there is practically no Mopani in the "fly belt," Mfuti and Mtondo predominating. In the Sebungwe belts open Gusu bush is the rule, but Mopani also occurs. The "fly" seems to avoid the two extremes of insufficient bush to afford the necessary shade, and the thick, nearly impenetrable bush full of undergrowth which borders in places some of the bigger rivers.

ASSOCIATION WITH BIG GAME AND BUFFALO.—As the experiment to determine the question of the necessity or otherwise of the presence of big game for the existence of the Tsetse Fly is still proceeding in the Hartley district, the writer is not prepared to make any pronouncement on this vexed question. That experiment, however, has no bearing

on the theory of the necessity of buffalo to the "fly," and the following observations on this point may be of interest. (1) Below the Escarpment in Lomagundi no traces of buffalo were seen in the "fly belts" either in October and November, 1910, or in April, 1911. There was a herd in October-November near Chitsunga's kraal on the Hunyani River, where there was practically no "fly." This is 15 miles from the Gorai River where the "fly" was thickest. (2) About 10 miles north-east of Tchetchenini Hill buffalo occurs at times. The "fly" here is not abundant, only nine being caught in a day's collecting (21/4/11). Some 15 miles to the north-east of this spot, fresh spoor of a herd of buffalo was seen crossing and re-crossing the path. No "fly" was seen here though a halt of several hours was made in the shade close by. (3) On the Umniati and Sakugwe rivers no spoor of buffalo was seen in December, 1910, and "fly" was plentiful. Buffalo is reported to occur, however, in the hills to the west of the Umniati about four miles distant from the river. (4) In Sebungwe to the east of Kariyangwe as far as Manzituba throughout the 35 miles traversed, "fly" is plentiful, and no traces of buffalo were seen, nor was there any report of their occurrence, though the natives stated there were herds further east on the Sengwe river. It would be strange indeed if the presence of buffalo were essential to the Tsetse, that the writer in visiting of set purpose the thickest populated "fly belts" in Southern Rhodesia, and noting carefully all the spoor of game seen should only see spoor of this animal in one locality, namely, between Tchetchenini Hill and the Escarpment in Lomagundi, and that in places where the "fly" was either rather scarce or was not encountered at all.

ENEMIES OF THE TSETSE.—Only one observation has been made under this head. A wasp belonging to the genus *Bembex* was caught in Mafungabusi, near the Umniati River in December, 1910, whilst making darts at Tsetse flies on the coat of a native. It did not succeed in catching any, however. Most species of this family of wasps provision their nests with flies, so that there is nothing very remarkable in attempts being made on the Tsetse occasionally. It is unlikely that the wasp has any special liking for the Tsetse above other flies.

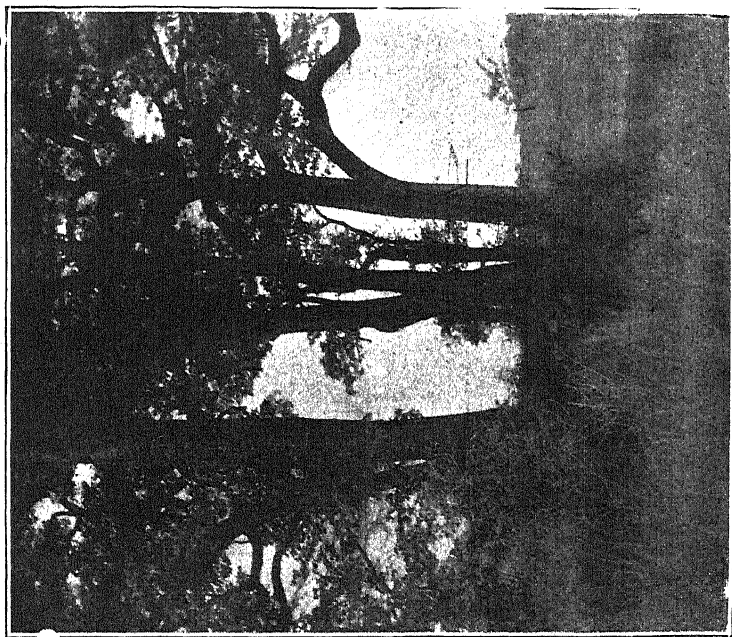


Plate II. Fig. 1.

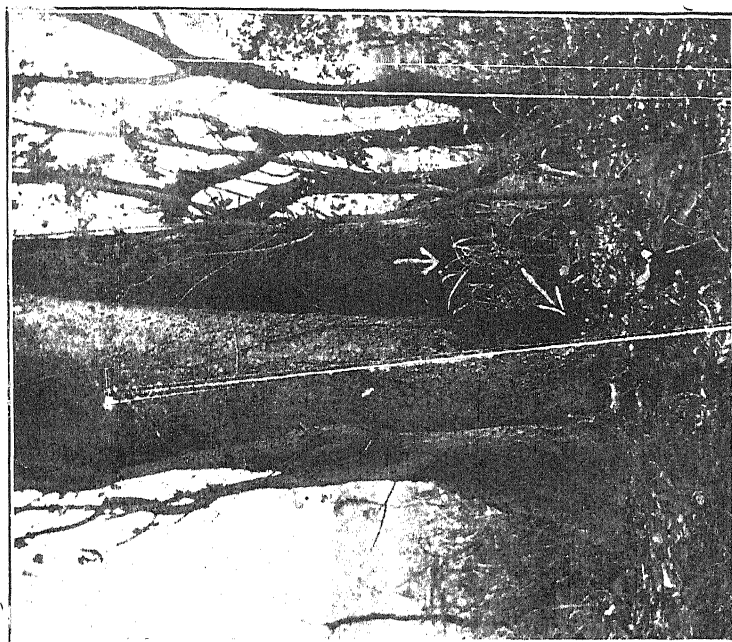


Fig. 2.

Game birds are frequently very plentiful in "fly belts," and might do some destruction amongst the pupæ. Along the Gorai River, in Lomagundi, in November, 1910, guinea fowl, "pheasant" and "redwing" were present in amazing numbers, so that as one worked along the bank they rose at almost every step. All the pupæ found up to the present have, however, been in places sheltered as much as possible from the scratchings of birds.

BREEDING HAUNTS.—The Tsetse's method of breeding has already been referred to. A lifesized illustration of three pupæ is shewn on Plate IV., fig. 3, the specimen on the left being seen in profile. The two projections at the anal end are characteristic of the Tsetse flies. The colour is a deep clove brown, nearly black. The length is 5·6 m.m., and the greatest breadth 3 m.m.

The first pupa case was found near the Gorai river in November, 1910, at the base of a large tree (*Ficus sp.*) some 60-70 yards from the river. The tree is shewn at Plate I., fig. 1. One case and a portion of another case were found in the earth between the roots of the tree. The soil itself was sandy and rich in humus, and numerous pupa cases of other *Diptera* and *Lepidoptera* were present. At that time, owing to the grass having been burnt, the ground about the roots was quite open. The appearance of the tree at the end of the wet season is shewn at fig. 2 on the same plate. The "fly" was thick along the bank of this river when dry in November, but not at all abundant there when the river contained water and the grass was abundant in April. Probably this tree is used chiefly as a winter breeding place. During a second visit to this spot in April, 1911, five other cases were taken under the same tree, but, as before, search elsewhere failed to produce any others. During a visit to the "fly area" in Sebungwe in August, 1911, however, the writer was more successful, eighty-seven empty pupa-cases and four living pupæ being found in two distinct localities and a variety of situations. A number of these situations are shewn in the adjoining plates, the spots from which pupæ were taken being indicated by an arrow head. All the pupa cases were found in the shelter of trees of some size, the most usual place being a hollow in the base of the tree as in Plate II.,

fig. 2, Plate III., fig. 1, and Plate IV., fig. 1, but the exposed roots of trees on sharply sloping ground were also very favourite situations. A unique situation was a small hollow in the trunk of a large Baobab on the banks of the Sinyama river. This hollow is shewn at Plate IV., fig. 2. It was cup-shaped inside and full of humus. Two empty cases and one living pupa were taken from this hollow. It contained many pupa cases of moths and flies other than Tsetse, and one or two living pupæ of both. The nearest to water that any cases were found was at the base of a clump of not very large trees growing on the bank of a pool (Plate III., fig. 2). The pupa cases, three in number, were found on the side away from the pool. The clump of trees shown at Plate II., fig. 1, are growing on a very high ant-heap (the photo was taken from above) and 25 empty cases were found about the bases of these trees, some on top of the heap and others on the sharply sloping sides. These trees are called by the natives (Batonga) *Mubulu*. A clump of the same species on an ant-heap some distance away produced four empty cases, and a clump of trees the natives called *Mudlaoza* on another ant-heap produced one, but the soil in this case was hard.

In all places except two where pupæ were found the soil was either sandy and easily worked, often rich in humus, or covered with leaves which afforded an easily penetratable shelter. In two instances cases were taken from hard soil, in one instance $1\frac{1}{2}$ inches below the surface, but the chitin which forms the case is an enduring substance in a dry situation, so the age of these cases is difficult to judge. The soil may have been soft when the larvæ entered or they may have penetrated along a crack. It is in the highest degree improbable that a larva could penetrate $1\frac{1}{2}$ inches of hard baked ant-heap. In every instance the ground was well drained and often the slope was very sharp. All the pupa cases except four were from trees near the bank of a river or wet vlel, where there was shade and where the "fly" congregates in the dry weather. The four excepted were taken from the base of a large Baobab tree on the summit of a hill (see Plate III, fig. 1.) not far from a river (the Sinyama) it is true, but away from the influence of the water, there being no shade about the roots in August. This

points to the fact that the larvæ are deposited in any convenient situation, when the "fly" is scattered during the wet weather.

Negative results were uniformly obtained from digging under bushes near the trees where pupæ were found. The soil here was generally very sandy and humus and shade were abundant, but the "fly" seemed to avoid it. This is probably on account of the danger of the pupæ being scratched up by game birds, unless snugly lodged where scratching cannot easily take place. Digging about the Mfuti, Msassa and Mopani trees on the veld, away from the rivers and winter shade produced no results. The ground here was generally baked very hard and "fly" did not frequent these parts in August.

The summary of the investigations into the breeding haunts is therefore, that in the dry weather the larvæ are deposited in sheltered positions about the bases of big shady trees, such as are at that time of the year practically confined to the banks of rivers, pools, and vleis, dry or otherwise on the surface. Generally the soil is easily worked, and often humus is abundant, and the drainage is usually good. The selection of a well drained situation may not seem necessary in the dry weather, but the instinct to select such would doubtless be of great value, when the pupal period extends into the rains. During the wet weather it is probable that the young are deposited more generally through the bush.

EXPLANATION OF PLATES.

PLATE I.

Fig. 1.—*Ficus* tree, near bank of Gorai river, below Escarpment, Lomagundi, in November, 1910. Arrows indicate where Tsetse pupa cases were found both when this photo was taken and in April, 1911.

Fig. 2.—Same tree in April, 1911.

PLATE II.

Fig. 1.—Clump of *Mubula* trees, on ant-heap near Manzituba, August, 1911. Twenty-five pupa cases were found about the bases of these trees.

Fig. 2.—Two *Mubula* trees, near bank of Manzituba, Pupa cases at base of each as shewn. August, 1911.

PLATE III.

Fig. 1.—Base of Baobab tree, on hill not far from Sinyama river, Sebungwe, August, 1911. Four empty pupa cases found.

Fig. 2.—Clump of small trees on bank of pool. Manzituba, August, 1911. Three pupa cases from base on upper side (away from pool).

PLATE IV.

Fig. 1.—Base of *Mopani* tree, on anthheap, near Manzituba. One pupa case found where arrow indicates. August, 1911.

Fig. 2.—Hollow, about 2 feet 6 inches from ground, in trunk of huge *Baobab*, on bank of Sinyama river, Sebungwe, August, 1911. One live pupa and two empty cases taken from hollow.

Fig. 3.—Pupæ of *Glossina morsitans*, photographed from life. The left hand specimen is seen in profile.

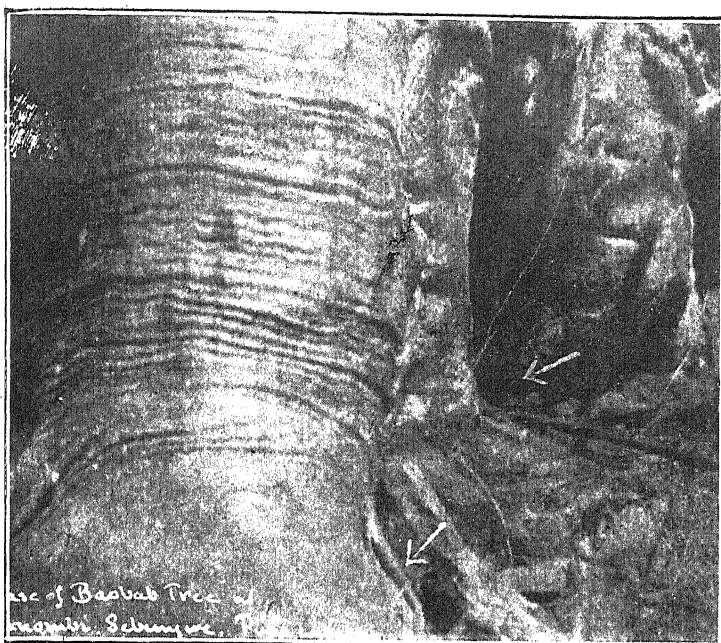


Plate III. Fig. 1.

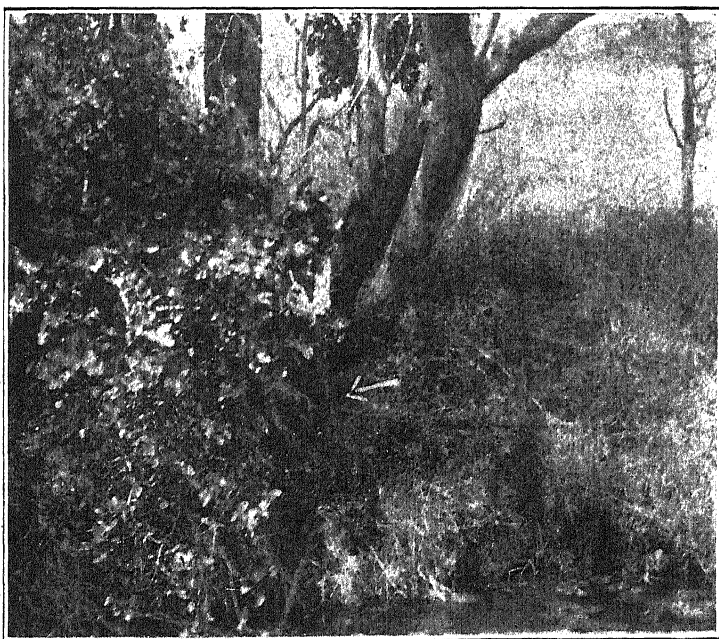
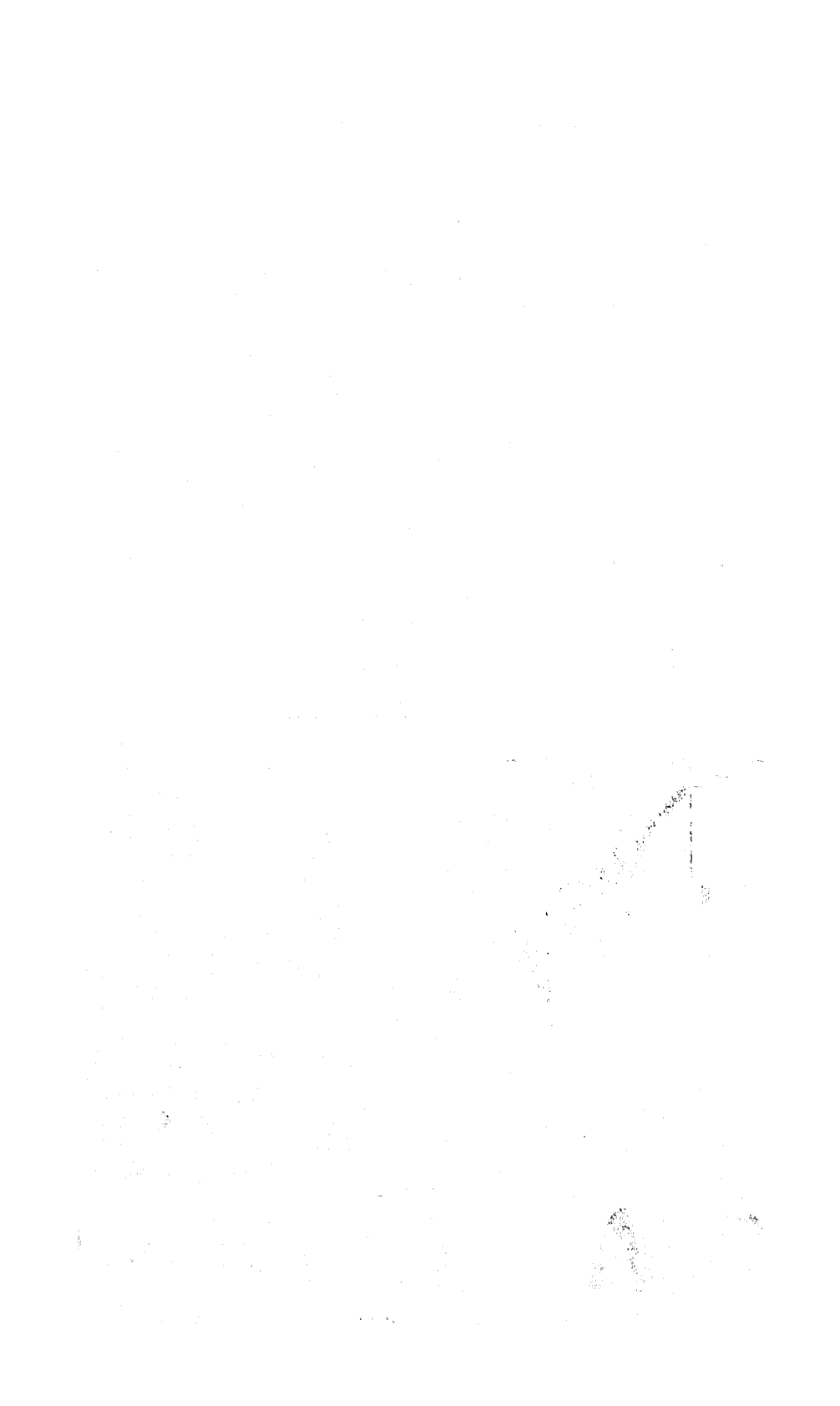


Fig. 2.



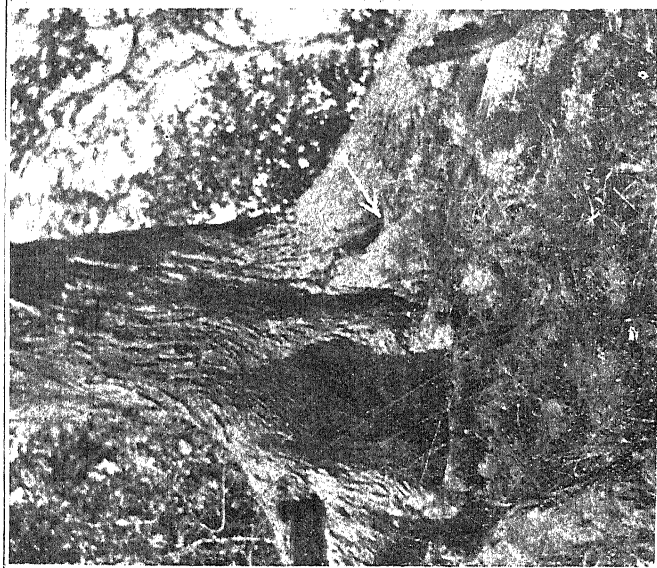


Plate IV. Fig. 1.

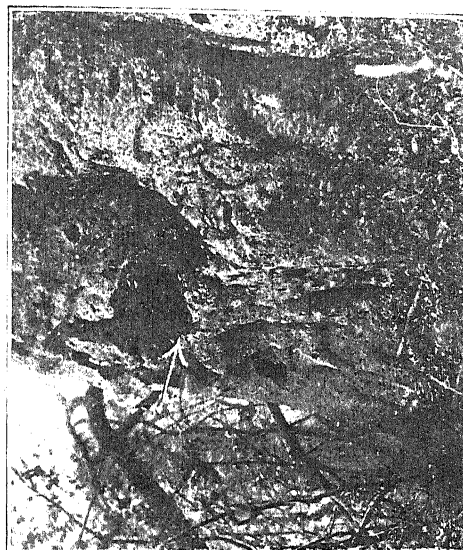


Fig. 2 (top). Fig. 3.



Pigs and Pig Breeding.

A short paper read before the Lalapanzi Farmers' Association.

BY MR. H. BIFFEN.

In going in for pig breeding, we have to consider what we are breeding for, we have the choice of three things, for the Factory, for the Pork Butcher or for our own use on the farm. I have found that the cross-bred Berkshire and Yorkshire is excellent for general purposes and would strongly recommend this cross to anyone starting pig raising. I recommend Yorkshire Boars and Berkshire Sows. From this cross I have reared young ones that weighed 80 to 90lbs. at 6 months old, and have sold pigs of the same cross at 9 months to the butcher for £3 15/- and £4 each. I have also produced very large pigs weighing between 400 and 500lbs. from them, and as long as we can raise pigs of these weights it pays very well to raise for sale to the Butchers, but it pays much better if you can turn the pig into bacon for yourself. I am willing to give members of the Association a very good and simple recipe for making bacon and ham, or it may be obtained from the Secretary. Pigs of the above mentioned cross I consider are hardier, better foragers and better breeders than pure breeds and for these reasons I recommend them. In breeding for the Factory I hardly think you will find it pay whilst grain remains at the present price, *i.e.*, maize 10/- a sack, monkey-nuts, 11/6, and pumpkins at from 90/- to 100/- a ton, at these prices I think it will pay better to sell your produce than to convert it into meat. I find that pigs thrive much better with constant change of food, I myself give my pigs as many changes of food as possible. Boiled wild melon with ground rapoko, or with mealie-meal makes an excellent food. Mealie-meal and separated milk makes a first-class food for finishing pigs off. Mealies by themselves I do not consider a good food, and they should only be given very sparingly to pigs that are styed or kraaled. I should advise anyone who

contemplates going in for pigs for bacon purposes to regulate the number they keep by the amount of milk they have. Butter milk or separated milk is essential in feeding for the production of first-class bacon.

In reply to questions Mr. Biffen said that his opinion was that it would not pay to feed pigs for sale with mealies at 10/- a bag, unless you have a corn and cob grinder and feed the pigs with this meal, and he also considered that this would be improved by the addition of some green stuff.

That he thought that a 200lb. pig (dead weight) would give 140lbs. of bacon and ham.

A member asked what was the loss between live and dead weight? This Mr. Biffen considered should not be more than 25%, but said that this depended somewhat on the condition of the pig, as if the pig was in first-class condition the percentage was not so great, and that if the pig was in low condition the loss was sometimes as high as 33%. In regard to Tamworth pigs he considered them good, but not so good as the cross he had mentioned.

Mr. Biffen promised to give the Association the results of the feeding of two pigs that he had that day put up for fattening, and the weight of the food given was to be checked, also to give the results of the different prices obtained in disposing of them. One is to be turned into bacon, and the other sold.

Hints to Dairy Farmers.

BY J. C. JESSER COOPE, F.C.S., N.D.D.

At a time when the establishment of bacon factories is under discussion, many farmers are probably considering the best methods to employ in the breeding, rearing and feeding of pigs. Skimmed milk or butter milk combined with a mixture of bran and maize meal is perhaps the best and most economical food for sows in milk, which require liberal feeding. They should be given as much of this class of food as they will consume, to enable them to rear healthy, vigorous pigs, whose digestion will be in good order, and which should therefore grow rapidly when weaned.

It has also been shown by many carefully conducted experiments that pigs fed on separated milk or butter milk, combined with maize meal, make growth more rapidly, have stronger bones, larger organs and more muscular tissue than those fed on maize meal, or a mixture of maize meal with other non-nitrogenous materials such as potatoes, the latter combination of foods is deficient in both the necessary protein and bone forming compounds. As a means of promoting rapid growth and a condition of health and vigour in pigs, and as a supplement to cereal grain foods, separated milk and butter milk are not excelled, and probably not equalled by any other feeding stuffs.

In the successful management of a dairy herd, the following matters will require the dairy farmers' utmost consideration :

I.—SELECTION OF THE BREED OF CATTLE most likely to suit the purpose of the farmers' requirements. Herds of thoroughbred stock are not essential, nor probably advisable, but it is necessary to select graded animals of known dairy breeds suitable for the purpose that may be required, either for the production of large quantities of somewhat poor quality milk, for sale as whole milk, or for the production of somewhat lesser quantities of richer milk for butter making or cream selling. In selecting, it is advisable to choose the

breed for which one has a natural inclination so long as cows from that breed can be obtained to produce the class and quantity of milk required. A farmer who has a natural inclination for Frieslands or Shorthorn should not buy, say, Kerrys or Jerseys, or *vice versa*.

2.—THE BULL should be thoroughbred from well known dairy stock of a good producing strain. Too much emphasis cannot be put upon the importance and value of a thoroughbred bull, he is half the herd and a most payable investment. It is better policy to reduce the number of cows kept, if necessary, and put additional capital into a good bull, than to keep a bad bull and a larger number of cows. It is indeed a "penny wise policy" to use or keep an inferior bull, for such an animal will reduce the value of the herd and the farmer's profits.

3.—FEEDING AND THE SELECTION OF FEEDING STUFFS:

The ration should contain sufficient solid digestable matter and be made up of foods containing the constituents necessary for the production of milk and flesh, as well as the heat and energy necessary to maintain the body in health. The successful dairy farmer should obtain a thorough understanding of this great subject, he should know the action of the different foodstuffs so as to make up rations containing the necessary albuminoids, fats and carbohydrates in the right proportions so as to ensure the best value for the food supplied. The best cows will not even do well if fed poorly or on food mixed in unsuitable proportions.

GOOD QUARTERS FOR COWS: but not necessarily expensive buildings, shelters affording plenty of light and air, where cows can be handled under sanitary conditions and kept clean, and where draughts on top of the cows' backs can be avoided should be provided. If cows are put into sheds during the night, it is of importance that they should on no account be subjected to sudden rises or falls in the temperature, for sudden changes of temperature adversely effect the milk yield as well as the quality of the milk.

CARE OF THE IN-CALF DRY COW: The dry cow often receives less attention than she deserves, she should be well fed, especially during the winter months. She requires nourishment, not only to maintain herself but also to build

up the frame of the future animal. It will pay the dairy farmer on most farms to make provision to feed the in-calf cows during the winter. Good feeding at this time will keep her digestive system in condition, and enable her to keep in good flesh. A dairy cow calving in good condition will return to the farmer through her milk, all the fat she has stored up during the dry period, and will give birth to a healthy vigorous calf, and be able to maintain a higher yield of milk than she otherwise could.

CARE OF THE HEIFER: The heifer is the future cow, and to rear profitable dairy cattle, care must be taken of the heifers to see they get a good start in life, and that set-backs are avoided. Any check to a young heifer will probably impair her future usefulness as a deep milking cow. It must be remembered that the in-calf heifer requires food for building up her own still growing body, as well as to maintain and develop the foetus, therefore special attention to the quality of her food is necessary.

When she drops her calf it is of very urgent importance that pains should be taken to train her to develop her mammary system and so to encourage her deep milking propensities. She should be milked as long as possible, even though at the end of her lactation period she produces very little milk, she will repay in the future, the time and trouble spent on her at this time.

REGULARITY IN MILKING AND FEEDING: Dairy cows should be milked at regular hours, for cows learn to know at what time they are expected to give down their milk, they get in the habit of having their nerves and glands ready to produce milk at the appointed time. Cows get accustomed to being milked by the same person, therefore milkers should not be changed more often than necessary, frequent changes of milkers will reduce the milk yield. Cows should be milked quietly and quickly, and should not be excited by strange surroundings, or by the presence of strangers at milking time.

WEIGHING AND TESTING THE MILK: To be successful, the dairyman must know the quantity and quality of the milk produced by each cow. He should also know the minimum quantity and quality of milk a cow should produce to

cover the cost of feed, management, etc., and any cow which approximates this minimum should be turned out of the dairy herd as she is not a profitable dairy cow. It is therefore necessary to ascertain what weight of milk each cow yields, and what amount of butter-fat such milk contains. The only way to obtain this information is to weigh the milk and to use some such butter fat tester as the Gerber or Babcock. If it is not possible to weigh and test the milk at every milking, fairly good results may be obtained by weighing and testing the milk of each cow one day each week, or even one day a month, morning's and night's milk. The amount of milk and fat produced in that single day multiplied by the number of days in the week or in the month as the case may be, will be approximately the yield for the week or month. For example, a cow's milk was weighed and tested on one day during the month of January, she produced in that day 25 lbs. of milk, containing 3.5% of fat. The amount of milk produced for that month will therefore be approximately $25 \text{ (the number of lbs.)} \times 31 \text{ (days)} = 775 \text{ lbs. of milk}$. Now $775 \text{ (lbs of milk)} \times 3.5\% \text{ (fat)} = 27.12 \text{ lbs. of fat for the month}$. Butter-fat testers are not very expensive appliances, and are easy to use, they are necessary to every dairyman who wishes to obtain the best results from the labour and capital employed in his business.

In an article of this sort, it is only possible to make a few suggestions without going into details.

Under present conditions it is not possible for all dairy farmers to immediately carry out the foregoing suggestions, but every dairyman who is determined to succeed should carefully consider how far he is able to conform to the methods which have given the best results in other countries, and to lay out his work so as gradually to bring his operations up to the standards which have proved the most profitable.

Preserving Meat on the Farm.

Mr. G. McCarthy, Biologist, North Carolina Department of Agriculture, writing on this subject, gives some very practical advice which I think may interest some of our readers. He says: "The old method of pickling meat in strong saltpetre brine is still very generally used by farmers. This method produces a strong flavour and rather dry and indigestible product. There is a popular impression that saltpetre is a very powerful preservative and that salted meat will not keep without it. In fact, saltpetre is not a preservative at all. It is a strong astringent, hardening the meat fibres, expelling the natural juices and decreasing the nutritious qualities of the meat. When taken into the human body in quantity, saltpetre acts as a powerful irritant of the mucus membranes of the stomach, bowels and kidneys. Death has been caused by larger doses of this substance. The use of saltpetre on the meat is unnecessary and undesirable. A much better and safer substance to use is Cream of Tartar—Potassium bitartrate. Of recent years manufacturing chemists have not been backward in offering to farmers and butchers various meat preservatives, sold under fancy names, at exorbitant prices. These "patent" meat preservatives and colouring matters are all injurious to health, and should be left severely alone. To make a good, mild and wholesome meat pickle, take the following:—

8 lbs. Common Salt.
2 lbs. Brown Sugar.
2 oz. Cream of Tartar.
4 gallons Water.

These quantities will be sufficient for about 100 lbs. of meat. To make up the pickle, first boil the water for 18 minutes and then stir in the salt, sugar and Cream of Tartar. Keep hot until all have dissolved. Let the pickle cool before using.

Pack the meat as solidly as possible in a clean barrel. Place the larger pieces at the bottom. No piece should measure more than 6 x 12 inches. Pour on the cooled pickle

so as to completely cover the meat. Cover the barrel tightly, and set away in a cool, dark, dry place. The meat may remain in the pickle until ready for use. If it is to be smoked, remove the meat from the pickle after six weeks and drain for a day or two before smoking. To smoke use green hickory wood. Those who like a flavour may add a few chips of Sassafras, or Juniper berries are preferred by some. The smoke house must be dark and airtight except the chimney. After smoking until a light brown colour is attained, wrap each piece of meat in brown paper and enclose in bags made of unbleached muslin. Tie or sew these securely, then dip the bags for two minutes into a thick lime or ochre wash to which has been added a little salt and some liquid glue. The water used in making this wash should have been boiled. Instead of bagging the smoked meat, it may be packed solidly and deeply in clean dry vats or chaff. It is not generally known that fresh meat and sausage may be kept sweet and sound during the cooler months by boiling or frying until about half cooked and then packing solidly in earthenware jars. Pour over the packed meat hot lard until it is completely covered. Cover the jars and set away in a cool, dark, dry place."—(Extracted from the *S.A. Agriculturist and Breeder*.)

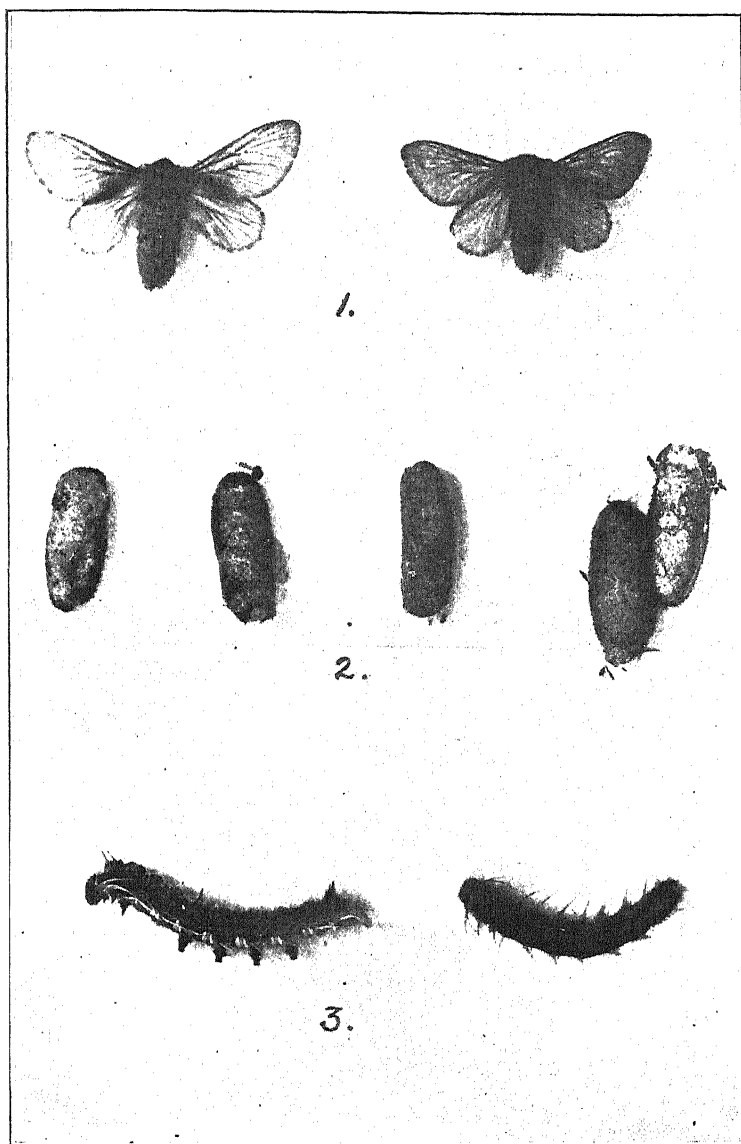


Plate I.

Notes from the Agricultural Laboratories.

ENTOMOLOGICAL.

Mimosa Thorn Caterpillar—The insect depicted in the adjoining plates is a serious enemy of the wild thorny Acacia so prevalent on the higher veld of Matabeleland and in some seasons attains the proportions of a veritable plague in and around Bulawayo. The adult moth shown somewhat enlarged at Plate I, fig. 1, has been determined by Sir George Hampson, of the British Museum, as *Haplopacha punctifascia*. *Wlk.* It is reddish-brown in colour, the wings being but lightly clothed with scales. It has a wing expanse of about 15-16ths of an inch. The pupa (chrysalis) is enclosed in a greyish cocoon (Plate I, fig. 2) a little over half an inch in length and about a quarter of an inch wide. The shape is roughly cylindrical, terminating rather abruptly at either end. The texture is tough and the contained pupa is quite hidden. The *pupa* itself measures about half an inch in length by three-sixteenths in greatest width, filling the cocoon tightly. The colour is yellowish-brown, darker anteriorly, with a median ventral darker stripe. The anal end is broadly rounded. The caterpillar (Plate I, fig. 3), when full grown, measures about one and a quarter inches in length. It is cylindrical in shape and hairy. The general impression of the colour is greyish. The head is black with the frontal triangle orange, the mouthparts being yellowish. Along the middle of the back runs a grey stripe with a black stripe on either side of it. A further lateral grey stripe runs along either side in the region of the spiracles, each of which is covered by a silvery white tuft. The claspers and true legs are, like the mouthparts, yellowish. A dorsal black tuft surmounts segments three, seven and twelve. The body is clothed in grey hairs, sometimes tinged with brown, longer on the sides than on the back.

There are reported to be two broods of this moth during the year. I have, however, only had the opportunity of observing the one of which the caterpillars are destructive in December, spinning up towards the end of the month. The moths emerged from these during the latter part of February.

During the latter part of December the caterpillars may be seen collected in clumps on the trunks of the trees as shown on Plate II. They form dense compact masses, sometimes completely encircling the smaller trees. The clumps usually occupy the most sheltered situation on the side of the trunk protected as much as possible from wind and sun. The underside of a leaning branch is a very favourite place. In such situations the moulted skins may be seen adhering to the bark in great numbers. When disturbed the caterpillars drop on long threads and many of the masses are protected by a good deal of web. I have not seen the caterpillars feeding much on the foliage during the day time, most of the feeding being apparently done at night. The cocoons are attached to the bark of the trunk and have been found from within 6 inches of the ground to 6 feet above it.

The damage done by the caterpillars to the native Acacias is very great, the tress over a wide area being completely defoliated. Some of the injured trees are shown on Plate III. These photos were taken at Bulawayo in December. Fig. 2 illustrates the restriction of the caterpillar's appetite to Acacia, another tree (*Cratægus sp.*) being seen in full foliage almost in contact with a completely defoliated Acacia. The defoliation of the trees naturally affects their growth and health considerably, and frequently induces severe gumming of the trunk and branches, and renders the wood liable to disease and decay. When repeated for several years the trees may be killed outright. In the case of native trees this may not be of any great importance, but the same pest will almost certainly attack the cultivated wattle, and so be the occasion of serious loss in plantations of this valuable tree. A similar pest has been described in the wattle plantations of Natal and is probably the same insect.

Besides the damage to foliage these caterpillars are frequently the cause of great annoyance and even suffering to the inhabitants of Bulawayo. The contact of the hairs with the human skin sets up severe itching, which on some people may lead to ulceration and nasty sores. If inhaled into the lungs in any quantity more alarming symptoms may be set up. When the caterpillars are swarming everywhere in a township, and the cast off skin blowing about in the wind, the matter becomes one of public health.

Luckily the caterpillar is attacked by several enemies and frequently these get the upper hand, and reduce the pest to negligible quantities for a season or two. Amongst its enemies are two species of flies belonging to the family *Tachinidae*. The mother fly lays its egg on the caterpillar, and the newly hatched maggot eats its way into the body, where it lives at the expense of the caterpillar until full grown, when it changes to a pupa (chrysalis). In the meantime the caterpillar may have had sufficient strength to spin a cocoon and even to change to a pupa itself, but the moth never emerges, only the adult fly. An Ichneumon wasp is reported to be the chief enemy of the Natal Wattle Caterpillar, and the cocoons of such an insect have been found on the Rhodesian form, but unfortunately no adults have been reared. The Ichneumons live at the expense of the caterpillar as do the Tachinid flies, but the female is provided with a sharp ovipositor by which she lays the eggs inside the body of the caterpillar instead of on it. A species of bug has also been seen sucking the caterpillars in the clumps at Bulawayo.

The caterpillars are not at all difficult to destroy. As a contact insecticide Paraffin Emulsion is quite effective, and owing to their habit of collecting in clumps can be used with considerable effect. Some judgment was found to be necessary in spraying a clump. If too fine and gentle a spray was applied the caterpillars dropped at once on their threads and some of them escaped. If too coarse and forceful a spray the insects were dislodged to a distance in clumps and many of them doubtless escaped death. A steady shower however wetted them at once, and seemed to paralyze them altogether, so that they hardly made the faintest motion when touched. Later they could be found hanging loosely to the bark by their anal ends, quite dead. Spraying the clumps can usually be effectively performed with a bucket pump fitted with a fan-shaped nozzle.

For protecting the trees earlier in the season spraying with an arsenical such as Arsenate of Lead is to be recommended. For this purpose a more powerful pump is necessary (see issue of this Journal for February, 1911). The poison should be used at the rate of 1 lb. to 10 or 12 gallons of water. The

use of arsenicals is only practically effective against caterpillars whilst they are small, so that a sharp lookout should be kept during early November for their appearance. In the general way the damage is done before the pest is noticed. Besides Bulawayo this pest has been reported from Umzingwane and Essexvale.

EXPLANATION OF PLATES.

PLATE I.

Fig. 1.—Adult moths (*Haplopacha punctifascia*), somewhat enlarged; actual wing expanse fifteen-sixteenths of an inch.

Fig. 2.—Cocoons; actual length rather over $\frac{1}{2}$ inch.

Fig. 3.—Caterpillars; actual length about $1\frac{1}{4}$ inches.

PLATE II.

Clumps of caterpillars on bark of wild acacias.

PLATE III.

Fig. 1.—Wild acacia trees defoliated by caterpillars, Bulawayo, December, 1909.

Fig. 2.—Wild acacia tree defoliated, and *Cratægus* close by untouched.

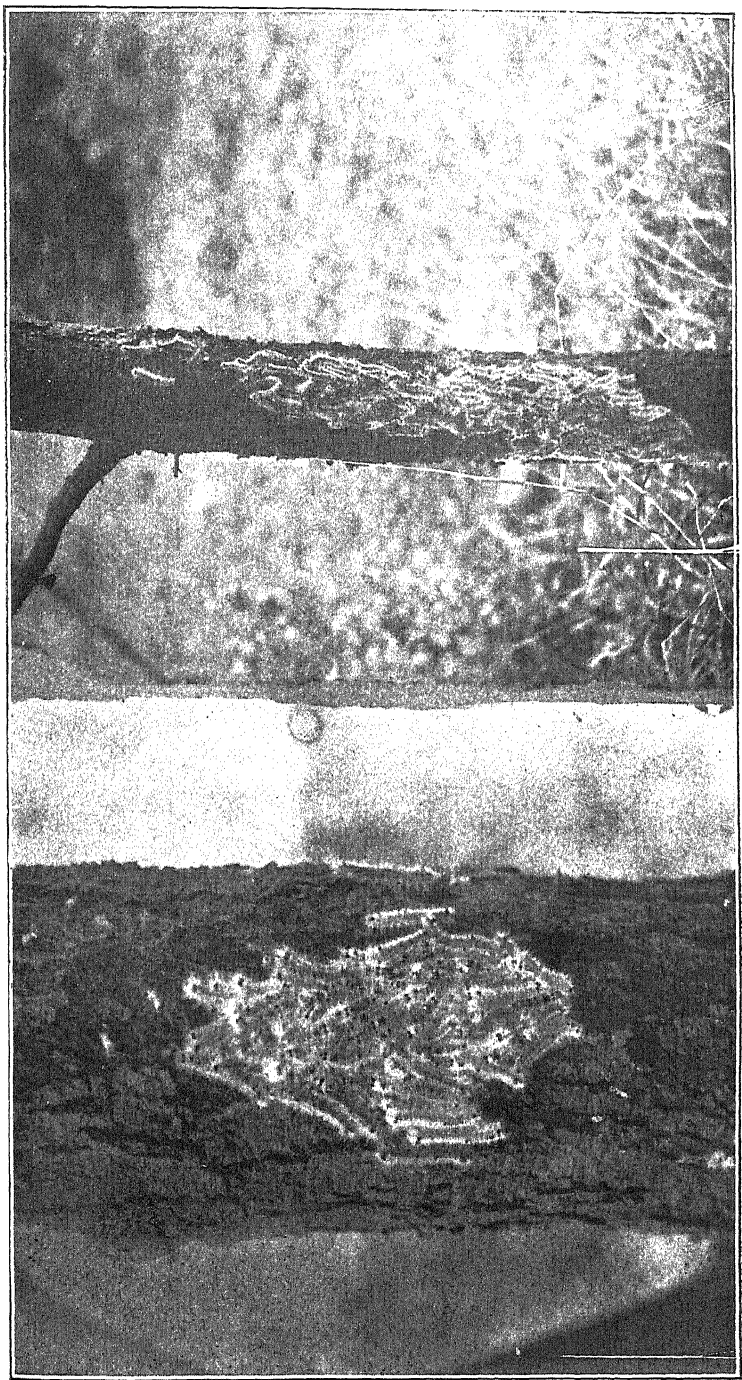


Fig. 1.

Plate II.

Fig. 2.

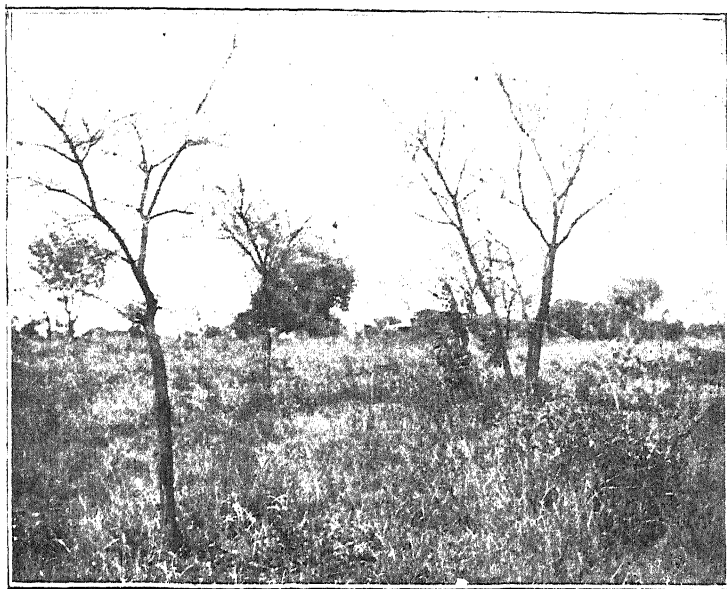


Plate III. Fig. 1.

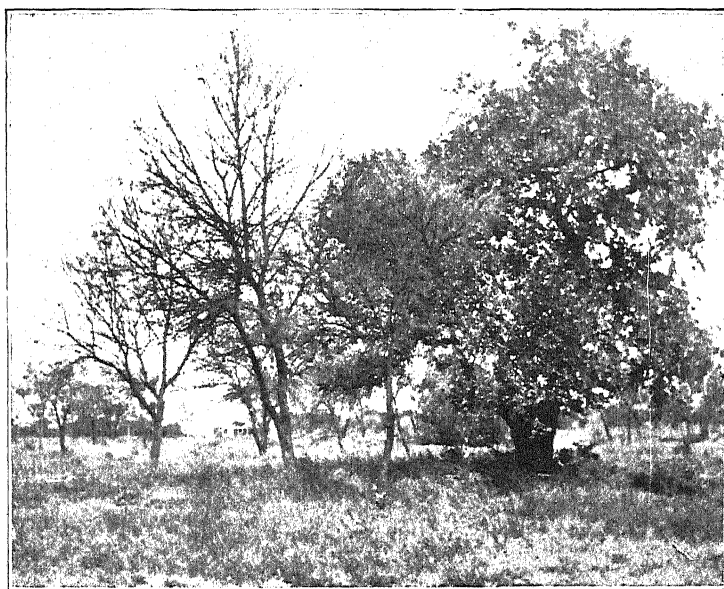


Fig. 2.

Rhodesia Merino Wool.

SALES ACCOUNT.

No. of bales	Customer.	Contents.	Report.	Valued at.
1	N. N. Rutherford	Merino fleece,	Good quality, fair staple and light	9½d. 10 months' growth
2	Do.	1st comb Fleece	Good quality and dry, but irregular in staple and rather wasting	7½d.
12	Do.	Locks	Fairly large and dry but little daggy	4¾d.
13	Do.	Bellies	Large but rather yolky and tippy	6d.
15	Do.	Mixed	Part coarse kem- py and run with black	4½d.
3	Meikle Bros., Melsetter, P.T.H. M.I.	Grse	Good quality but short wasting, and part daggy	6d.
4	Do., M.2	Grse. comb	Good quality and dry but irregular in staple and rather wasting	7½d.
11	Do., M.3	Grse. comb	Do. Do.	7½d.
14	Meikle, Melsetter	Grse	Good quality but short wasting, and part daggy	6d.
5	P. J. A. Moolman	Grse	Do. Do.	6d.
8	Kok	Grse. comb	Good quality and dry, but irregular in staple and rather wasting	7½d.
9	Mrs. E. H. Steyn	Grse. comb	Do. Do.	7½d.
6	J. Meikle	Do.	Do. Do.	7½d.
7	Do.	Do.	Do. Do.	7½d.
10	Do.	Do.	Do. Do.	7½d.

ACCOUNT SALES OF WOOL SENT TO ENGLAND.

Bale.	lbs. Nett.	d.	£ s. d.
I	275	9½	10 17 8
2, 5, 6 & 10	1,659	8½	58 15 1
II	114	6½	3 1 9
2a 1 sack	85	7	2 9 7
I3	32	6½	0 17 4
I2	25	4	0 8 4
I4	82	7½	2 11 3
—	52	6	1 6 0
3 and I4	{ 213 39	{ 4¼ — }	4 9 3
4	264	4¼	4 13 6
			<hr/> £89 9 9

The expenses from Umtali to England, including those of sale, averaged 1'33d. per pound.

Market Reports.

Mail advice received from Messrs. Fear, Colebrook & Co., of Southampton, shews that the Home Markets have recovered after a period of disorganisation due to strikes. The markets are now firm and a general advance has been made in prices. This firm supplies the following prices:—

Yellow round maize, 26/6 to 27/6 per 480 lbs. c.i.f.

South African maize, 27/- to 27/6 per 480 lbs. c.i.f., or 10/2½ to 10/5 per bag, free on board.

River Plate oats 16/6 to 16/9 per 304 lbs., c.i.f., to the United Kingdom, or equal to 7/0½ to 7/2 per bag, free on board South African ports

South African oats 7/2 to 7/3½ per bag, free on board.

Red wheats, 34/6 to 38/-, white wheats, 35/- to 36/6 per 480 lbs. c.i.f.

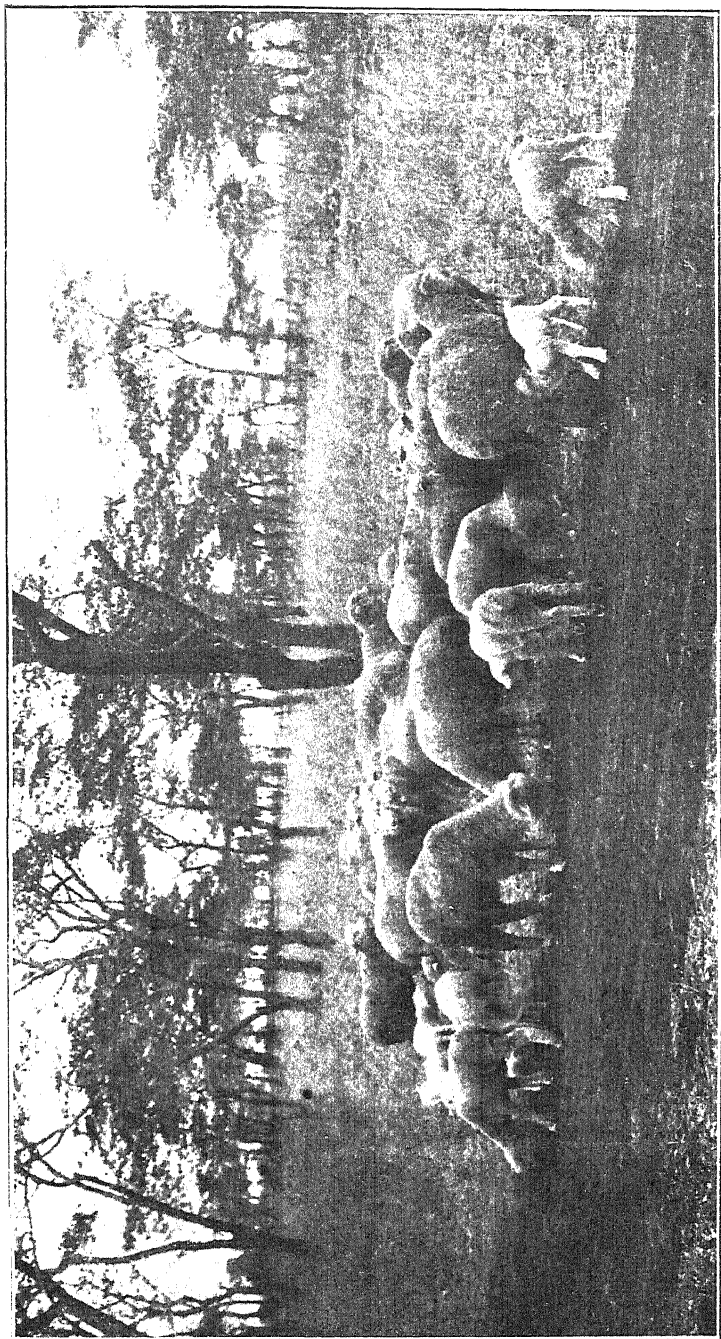
We are indebted to the following firms for prices:—
Messrs. Fear, Colebrook & Co., Ltd., Southampton; Messrs. Jas. Lawrence & Co., Ltd., Kimberley and Johannesburg; Messrs. Wightman & Co., Ltd., and Messrs. Whitfield & Co., Salisbury.

Article.	Johannesb'rg		Kimberley.		Bulawayo.		Salisbury.	
Barley, per 150 lbs. ...	10/0	11/9	9/0	12/6	—	—	—	—
Beans, per 203 lbs. ...	16/0	26/6	—	—	—	—	—	—
Beans, Sugar ...	20/0	32/6	20/6	30/6	—	—	—	—
Beans, kafir, per 203 lbs.	17/0	18/0	18/0	23/0	9/6	10/6	25/0	27/6
Boer Meal, unsifted, per 200 lbs. ...	—	—	21/6	23/0	—	—	—	—
Boer Meal, sifted, per 200 lbs. ...	20/0	25/0	24/0	26/0	42/0	43/0	45/0	47/0
Bran, per 100 lbs. ...	7/0	7/6	6/0	6/6	14/0	14/6	15/6	17/6
Flour ...	—	—	—	—	—	—	—	—
Flour, Colonial 100 lbs.	—	—	14/6	15/6	22/0	22/6	20/0	24/6
Forage, T'vaal, 100 lbs.	—	—	5/-	5/6	—	—	—	—
" O.R.C. "	—	—	—	—	—	—	—	—
" Colonial "	—	—	4/6	5/6	—	—	—	—
" Oat "	4/9	5/3	—	—	12/6	13/0	10/6	12/6
Hay, per ton ...	—	—	—	—	60/0	65/0	—	—
Kafir Corn, White, per 200 lbs. ...	14/0	14/6	13/6	15/6	8/0	8/6	—	—
do. Mixed 200 lbs.	10/9	11/3	—	—	—	—	—	—
Manna, per 100 lbs. ...	2/0	3/0	—	—	—	—	—	—

Article.	Johannesb'rg		Kimberley.		Bulawayo.		Salisbury.	
Mealies, S.A., White per 200 lbs. ...	9/9	10/9	11/0	11/6	10/0	11/0	9/6	10/0
Mealies, S.A., Yellow, per 200 lbs. ...	9/9	10/9	11/0	11/6	9/0	9/6	—	—
Mealie Meal, White, per 200 lbs. ...	—	—	11/0	11/6	—	—	—	—
Manga, per 200 lbs. ...	—	—	—	—	—	—	12/0	14/0
Monkey Nuts, per lb. ...	—	—	—	—	2d.	3d.	2d.	3d.
Oats, per 150 lbs. ...	8/0	10/6	11/6	12/0	20/0	21/6	22/6	25/0
Onions, per 120 lbs. ...	26/6	33/0	21/0	27/6	20/0	21/6	27/6	30/0
Peas, per 200 lbs. ...	15/6	19/3	—	—	—	—	—	—
Potatoes, per 150 lbs. ...	3/6	7/6	4/6	7/6	15/0	21/0	25/0	27/6
" O.R.C. ...	—	—	—	—	—	—	—	—
" New ...	10/0	12/0	9/0	14/0	—	—	—	—
Rapoko ...	—	—	—	—	—	—	15/0	16/0
Rye, per 200 lbs. ...	13/0	14/11	—	—	—	—	—	—
Salt, per 200 lbs. ...	—	—	3/0	4/0	10/6	11/6	15/0	16/0
Tobacco, good, per lb ...	2d.	7d.	4d.	7d.	—	—	—	—
" inferior, per lb ...	—	—	1d.	2d.	—	—	—	—
Wheat, per bag 203 lbs ...	16/6	20/0	18/6	20/6	—	—	27/6	30/0
Butter, per lb. ...	1/0	1/2	1/0	1/3	1/6	1/9	2/0	2/6
Butter, second quality ...	9d.	1/3	10d.	1/0	—	—	—	—
Eggs, per doz. ...	1/8	2/0	9d.	1/0	1/6	2/0	—	2/6
Ducks, each ...	2/0	3/6	3/0	4/0	3/0	3/6	—	4/6
Fowls, each ...	2/0	3/9	1/6	3/0	1/6	2/0	—	4/6
Geese, each ...	4/0	4/10	—	—	—	—	—	12/6
Turkeys, each ...	7/0	14/0	5/0	12/6	6/6	8/6	—	£1
Oranges, per 100 ...	—	—	—	—	—	—	—	—

LIVESTOCK.

	£12	£25	£10	£25	£20	£24	£25	£30
Horses ...	£12	£25	£10	£25	£20	£24	£25	£30
" Mares ...	—	—	—	—	—	—	—	—
Mules ...	£12	£25	£20	£30	£31	£37/10	—	£30
Donkeys, geldings ...	£6	£8	£5	£7	£7/0	£8/0	£7	£8
" mares ...	—	—	£6	£8/10	£8	£10	—	—
Cows, Dairy ...	—	—	—	—	£25	£35	£25	£30
Cows, Native ...	—	—	—	—	£7	£9	—	£10
Heifers, Colonial ...	—	—	—	—	£8	£17/10	—	—
Heifers, Native ...	—	—	—	—	—	—	£5	£6/10
Oxen, Trained ...	—	—	£7	£8	£8/10	£11/10	—	£10
Oxen, Ordinary ...	—	—	—	—	—	—	£8	£9
Cows, Slaughter ...	£6	£8/10	£7	£8	—	—	—	—
Oxen, good ...	£10	£13	£10	£13/10	—	—	—	—
Oxen, medium ...	—	—	£8	£9	—	—	£8	£20
Calves, ...	—	—	£2	£3/10	—	—	—	—
Sheep, ...	11/6	22/6	14/0	17/6	15/6	17/6	—	£1
Lambs, 30 lbs. ...	7/6	10/6	8/0	10/0	—	—	—	—
Hamels ...	—	—	13/0	15/0	—	—	—	—
Kapaters ...	—	—	—	—	—	—	—	—
Pigs, clean, per lb. ...	3d.	3½d.	3d.	3½d.	5d.	8d.	—	4d.



Merino ewes and lambs. Botanical Experiment Station, Salisbury

Agricultural Reports

FOR JULY, AUGUST AND SEPTEMBER, 1911.

Farmers have for the most part been busy in harvesting and threshing the maize crop. Owing to the unprecedented shortage of labour these operations have been much delayed, with the result that the usual farm work is much behind hand.

Maize crops on red land have generally been disappointing, and the total crop is likely to be under rather than over the estimate. Owing to the fact that many farmers have not completed their threshing it is impossible to state the actual maize production for the season. For the same reason the Salisbury Farmers' Co-Operative Society have been unable to estimate the amount of grain forthcoming, and to avoid the danger of over-exporting only small amounts have been shipped. This is unfortunate, since with prices for maize ruling so high on the home market, an exceptional opportunity of realising good prices for grain has offered.

The scarcity of labour is also affecting the supply of small seeds, such as Boer manna and beans, no hands being available for threshing, the result is an increased price for these seeds.

A large number of farmers have planted early crops of potatoes in August on damp land or under irrigation. Most of these are promising well, but late frosts have proved destructive in some districts.

A feature of the winter season is the success which has attended the growing of winter cereals, particularly wheat, on naturally moist land without irrigation. There seems no longer any doubt that profitable crops can be grown in this manner.

An unfortunate outbreak of Rabies has occurred in the Gwelo and Enkeldoorn districts, several mules which were bitten by infected dogs having become rabid.

Native crops throughout the Territory are considerably below the average, but no serious shortage of grain is anticipated except in the N'Danga district where the natives are buying mealies at 20s. per bag. In the Chibi district some kraals are selling the cattle in order to buy grain, but on the other hand, from Gutu comes the report that some natives are buying more grain from the traders instead of troubling to thresh last season's crop.

The natives on the Angwa River are reported to be taking up the cultivation of European beans and peas, and both on the Angwa and Hunyani Rivers the winter planted maize crops are said to be good.

Native stock is in good health and condition, the late May rains having brought up excellent feed in the "gardens." From the M'toko district it is reported that one native traded away 60 head of cattle in a fortnight.

In the Victoria district lions have been plentiful and have destroyed a good many head of cattle, both native and European. Leopards have been troublesome in Chilimanzi, and in one case a leopard gained access to a calf pen and killed nine calves.

Several Native Commissioners have turned out the natives to assist in putting out grass fires and also to assist farmers in burning fire breaks around their farms. This is a concession which should be taken greater advantage of. The reward offered for baboons has in some cases attracted the natives, and in one district it is stated that a considerable number of these animals have been trapped by the natives in order to gain the reward. It is to be hoped the custom will become more prevalent.

Veterinary Report July and August, 1911.

SALISBURY.

AFRICAN COAST FEVER.—No cases of disease have occurred. The testing of the areas is being carried out.

GLANDERS.—49 horses and 20 mules were tested and found healthy.

INYANGA DISTRICT.

Remnants of one herd of native cattle destroyed, one infected herd remains.

MAZOE.

Three outbreaks of scab reported affecting 50 animals which have been placed in quarantine.

BULAWAYO.

AFRICAN COAST FEVER.—Ballarat outbreak. No further deaths occurred, and the balance of the cattle were removed into the fenced area on the Mzingwani, after passing through temperature camps.

WOOLENDALE OUTBREAK.—Several large herds were moved into the uninfected portion of this estate, after passing through temperature camps, leaving only one herd in a temperature camp, out of which two animals were destroyed. The eleven head of infected cattle at Mvulanis kraal were destroyed.

BULAWAYO COMMONAGE.—Cases occurred in several small herds running on the fenced infected portion of the Commonage, in all 36 animals have been destroyed or died of the disease.

In the middle of August the two extra dipping tanks were completed, and the dipping of the cattle commenced, the dip used being the "Natal 3 days dip."

GLANDERS.—The following animals were tested:—

Horses	...	..	311
Mules	...	...	434
Donkeys	...	...	844

One horse reacted and was destroyed. The post mortem examination confirming the test. The Principal Veterinary Surgeon, Union Government, has been advised, and is endeavouring to trace the origin of this animal.

NYAMANDHLOVU.

BLACK-QUARTER, REDBANK.—No further deaths have occurred since the cattle have been moved to clean veld.

INSIZA.

BLACK-QUARTER.—An outbreak occurred on Innesfallen farm, eleven deaths in all have occurred. The farm is being fenced.

UMTALI,

One outbreak of scab reported.

OTHER DISTRICTS.

No cases of contagious disease have been reported.

RABIES.—Cases of rabies have occurred in the Selukwe, Gwelo, Enkeldoorn and Chilimanzi Districts.

Weather Bureau.

TEMPERATURES.

STATION.	JULY.		AUGUST.	
	Max.	Min.	Max.	Min.
MASHONALAND—				
Chicongas Location	72°10	42°00	77°20	46°50
Chishawasha	69°20	38°80	73°70	42°50
Giant Mine	72°48	44°70	70°26	48°90
Hallingbury	72°77	37°80	79°10	44°00
Hartley ... ..	...	...	...	...
Inyanga (York Farm)	61°64	38°58	...	...
Melsetter	62°6	...	65°60	...
Melsetter (Mount Selinda)	64°34	44°21	68°71	46°95
Salisbury Gaol	67°60	39°40	78°00	45°30
" Laboratory	67°46	38°77	72°33	45°13
Shamva	71°14	45°22	75°59	49°52
Sinoia	72°87	36°32	78°00	42°03
"Summer Field" (Umtali)	77°17	38°94	82°62	42°96
Umtali	74°06	45°92	...	...
MATABELELAND—				
Bulawayo (Observatory)	68°30	40°70	74°30	46°0
Empandeni	71°07	36°65	77°69	45°26
Gwelo	68°22	38°92	74°48	44°38
Rhodes Matopo Park	66°50	38°10	71°25	43°32
Tuli ... ..	...	...	78°90	...
Victoria Falls	74°75	37°95	83°58	45°08

RAINFALL.

STATION.	July.	August.
MASHONALAND—		
Banket Junction	Nil	...
Charter (Meikle's Farm)	Nil	Nil
Charter (Range)	Nil	0°09
Chicongas Location	0°01	0°05
Chishawasha... ..	Nil	0°22
Darwin	Nil	Nil
Driefontein	Nil	Nil
"Eagle's Nest"	0°01	1°04
Eldorado (Railway Station)	Nil	Nil
Enkeldoorn	Nil	0°10
Gatooma	Nil	Nil
Gatooma (Railway Station)	Nil	...
Gadzema (Giant Mine)	Nil	0°14
Goromonzi	Nil	0°35

RAINFALL—*continued.*

STATION.				July.	August.
MASHONALAND—(Continued)					
"Grootfontein" (Umvuma)	...	...	...	Nil	Nil
Gutu	...	...	...	...	Nil
"Hallingbury" (Hartley)	...	...	...	...	0'06
Hartley (Gaol)	...	...	...	Nil	...
Hartley, Railway Station	...	...	...	Nil	...
Helvetia (Melsetter)	...	...	...	0'39	2'22
Inyanga	...	...	...	0'21	Nil
Lone Cow Estate	...	...	...	Nil	Nil
Macheke (Railway Station)	...	...	...	Nil	...
Marendellas (Railway Station)	...	...	...	Nil	...
Marandellas (Land Settlement Farm)	...	...	...	Nil	0'41
Marandellas (Good Hope)	...	...	...	Nil	Nil
Melsetter	...	...	...	0'97	0'64
Monte Cassino	...	...	...	...	0'11
Morgenster	...	...	...	0'04	0'41
Mrewa	...	...	...	Nil	0'26
M'toko	...	...	...	Nil	0'16
Mount Silinda	...	...	...	0'48	0'59
Rusapi Railway Station	...	...	...	Nil	...
Salisbury	...	...	{ Gaol	Nil	0'02
			{ Laboratory	Nil	0'14
			{ Public Gardens	Nil	0'08
			{ Railway Station	Nil	...
Summerfield Farm	...	...	...	0'30	0'19
Shamva	...	...	...	Nil	0'01
Sinoia	...	...	...	Nil	Nil
"Tom's Hope" (N. Melsetter)	...	...	...	0'12	0.24
Umtali	...	...	...	Nil	...
Umtali Railway Station	...	...	...	0'13	...
Umvuma Railway Station	...	...	...	Nil	...
"Utopia," Umtali District	...	...	...	0'16	0'28
"Vermont," Melsetter District	...	...	...	0'41	1'23
MATABELELAND—					
Balla Balla	...	...	...	0'01	...
Bembezi (Railway Station)	...	...	...	Nil	...
Bulawayo	...	...	{ Observatory	Nil	Nil
			{ Raylton	Nil	...
Central Farm (Rhodesdale Estate)	...	...	...	Nil	0'26
Empandeni	...	...	...	Nil	Nil
Fig Tree	...	...	...	Nil	0'12
Filabusi	...	...	...	Nil	0'01
Gwaai Railway Station	...	...	...	Nil	0'70
Gwanda Railway Station	...	...	...	Nil	...
Gwelo	...	...	...	Nil	Nil
Gwelo	...	...	{ Railway Station	Nil	...
			{ Lower	Nil	Nil
Heaney Railway Station	...	...	...	Nil	...
Insiza Railway Station	...	...	...	Nil	...
Malindi	...	...	...	Nil	Nil
Marula	...	...	...	Nil	Nil
Matopo Mission	...	...	...	Nil	0'17
Matopo Park	...	...	...	Nil	0'01

RAINFALL—*continued.*

STATION.	July.	August.
MATABELELAND—(Continued)		
Nyamandhlovu	Nil	...
Plumtree ... ..	...	0'09
Que Que ... ..	...	0'05
Selukwe (Railway Station)	Nil	...
"Shawlands" (Gwelo)	Nil	...
Solusi	Nil	...
Tuli	Nil	0'16
Victoria Falls Railway Station	Nil	Nil
Wankie { Hospital	Nil	...
... .. { Railway Station	Nil	...
West Nicholson Railway Station	Nil	...

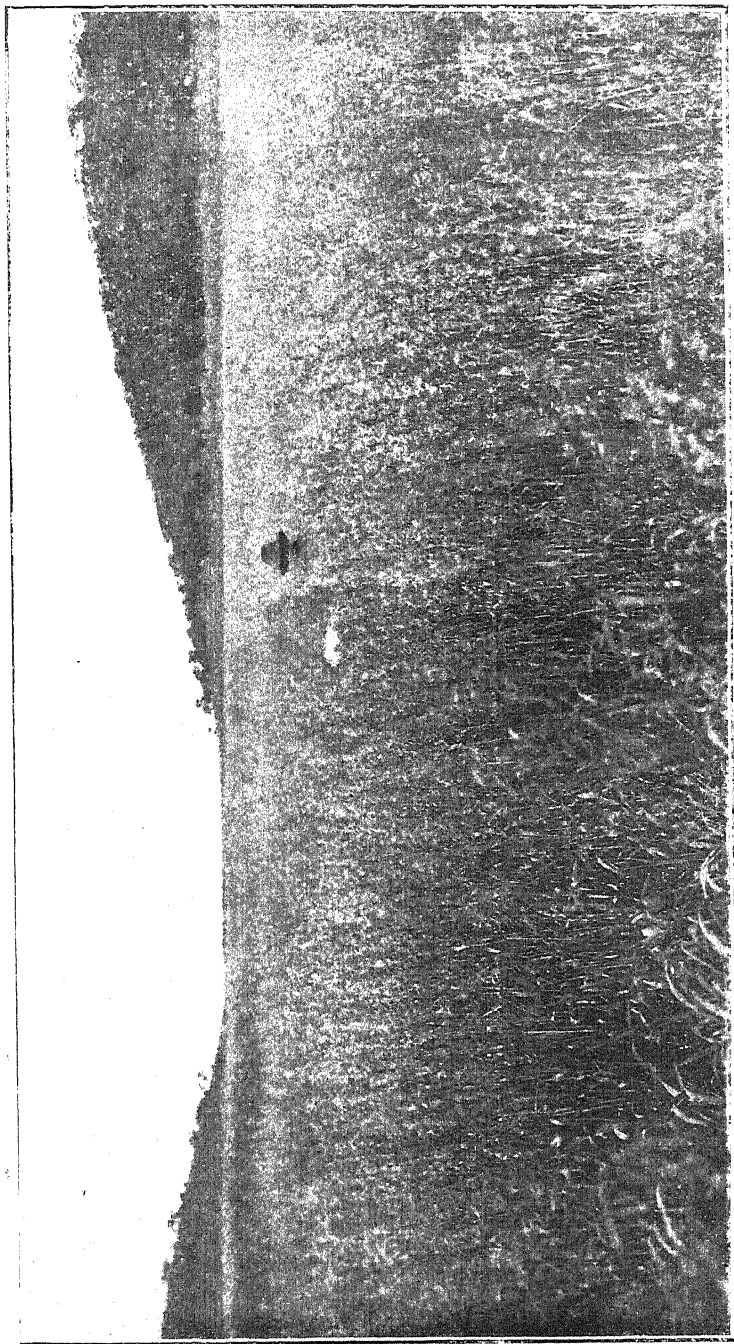
Dates of Meetings of Farmers' Associations, Southern Rhodesia.

(SUBJECT TO ALTERATION).

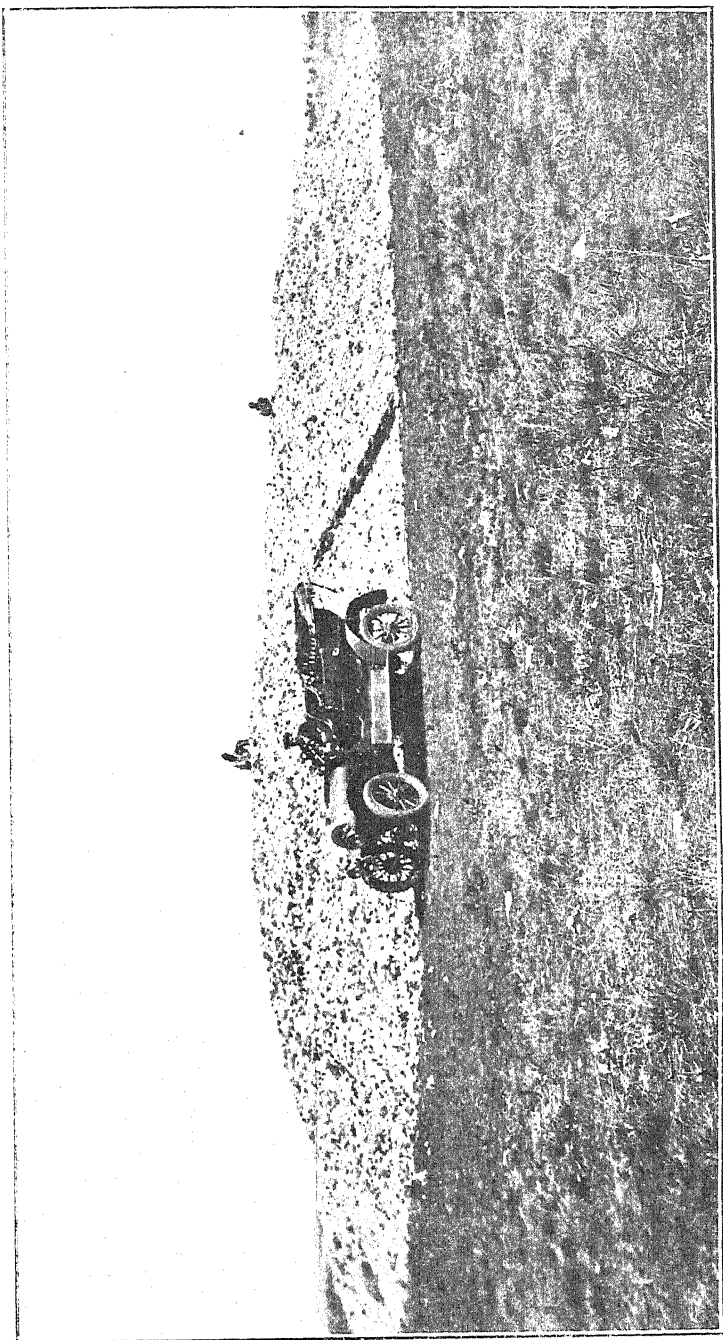
Name of Association.	Place of Meeting.	Secretary.	1911.											
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Rhod. Landowners & Farmers	Bulawayo	Harry Hopkins	27	24	31	28	26	30	28	25	29	27	24	29
Midlands	Gwelo	M. L. Price	14	11	18	15	13	10	8	12	9	14	11	9
Mashonaland	Salisbury	W. H. Williamson	14	4	4	1	6	3	1	5	2	7	4	2
Manica	Umtali	P. B. Snaashall	14	11	4	1	6	3	1	5	2	7	4	2
Hartley	Umtali	H. F. Savory	14	11	11	8	13	10	8	12	9	14	11	9
Mazoe	...	V. W. Fynn	...	...	...	...	...	...	...	...	...	...	...	...
Lomagundi	Sinoia	P. W. Kidwell	21	...	25	...	20	...	22	...	23	...	25	3
Marandellas	Marandellas	C. M. Wright	...	...	...	...	...	...	...	...	...	...	...	...
*Central	Umvuma and Enkel- doorn alternately	Rev. A. J. Liebenberg	28	25	25	29	27	24	29	26	30	28	25	30
North Umtali	Summerfield and Nakasaba Mission	R. H. O. Blurten	7	...	4	...	6	...	1	...	2	...	4	...
Victoria	Victoria	T. Rutherford	...	4	...	1	...	3	...	5	...	7	...	2
Victoria (Eastern)	Good Hope Farm	F. A. Readman	...	15	...	19	6	21	1	16	2	18	...	20
*Macheke	Macheke	G. F. Kidson	7	4	4	1	...	...	...	...	...	7	4	2
*Melsetter	Melsetter	D. M. Stanley	...	...	...	...	...	...	...	...	...	...	...	...
Gazaland	Lower Melsetter	J. W. Scott	5	...	...	6	...	1	6	...	...	5	...	...
Plumtree	Plumtree	J. Reid-Kowland	...	2	...	6	...	...	...	3	...	5	...	7
*Figtree	Figtree	J. T. Kirschbaum	...	...	...	...	...	...	...	...	...	...	...	...
Makoni	Rusapi	F. A. Lapham	7	4	...	1	6	3	1	5	2	7	4	...
Matopo	Matopos	W. E. Dowsett	...	...	5	...	...	8	4	...	3	...	...	3
Makwiro and Norton	Makwiro	F. R. McLellan	...	...	9	...	...	...	...	14	...	7	...	14
Kimberley Reefs	Kimberley Reefs	G. O. Smith	...	5	...	2	...	4	...	...	...	7	...	3
Somabula and Shangani Flats	Somabula	S. Annandale	...	4	...	1	6	3	1	5	2	7	4	2
Headlands	Headlands	H. Barnes Pope	7	4	4	1	27	29	29	30	30	28	25	30
Marula	Marula Siding	MacW. Ingram	28	25	25	29	27	24	29	20	2	...	...	2
Umvumvumu	T'Membarra Mission	N. N. Rutherford	...	...	4	...	1	...	...	1	...	7	...	...
Isizwa	Isizwa Station and Peggy Store alternately.	...	7	...	...	...	...	...	...	...	...	...	...	...
†Enterprise	Enterprise	Jas. Watson	...	...	...	...	...	...	...	...	...	...	...	...
Gatooma	Gatooma	Col. Leonard, President	...	...	...	...	...	...	...	...	...	14	11	9

† Dates not Supplied.

* Date Uncertain.



Fifty acres of Sidonian Oats on Stamford Farm, near Salisbury. Grown without irrigation on heavy black loam. Photographed August, 1911



*Templeton Bros'. maize dump on the farm Derry, Salisbury District. Dimensions, 37 x 18 x 3½ yards
Unhusked ears awaiting the power threshing machine*

Correspondence.

The following letter addressed to the Director of Agriculture, was received for reply through the medium of the Journal:—

Sir,—The planting of potatoes will be in full swing shortly and Potato Scab (*Oospora scabies*) is nearly all over the country. Could you give us any remedy for it? I have tried Formalin but the cost is too great. Could farmers get Blue Stone in kegs that would be strong enough and cheap enough to use as a fungicide, and if so, what quantity of water to the pound of Blue Stone could be used to form a dip (a large paraffin tin to reckon as four gallons).

I am, etc.,

A RRODESIAN FARMER.

TREATMENT OF SEED POTATOES AGAINST POTATO SCAB (*Oospora scabies*.)

A solution of Blue Stone (Copper Sulphate) is not recommended for soaking seed potatoes. It is an active fungicide, but has an injurious effect on vegetable tissues when brought into contact with them. When mixed with lime to form Bordeaux Mixture it can be safely used, and has in this form proved efficacious against Potato Scab according to at least one authority. The cost of Bordeaux Mixture in this country is, however, considerably greater than that of Formalin and is probably less efficient, as it contains a sediment which settles during the process of soaking the tubers. Another substance that has proved very effective in preventing Potato Scab is Corrosive Sublimate (Mercuric Chloride). This is used at the rate of 4 ozs. to 30 gallons of water and costs sixpence per oz., thirty gallons thus costing two shillings, as against four and sixpence for the same quantity of Formalin solution. Corrosive Sublimate is, however, a dangerous chemical unless very carefully stored and handled.

It is both corrosive, as its name implies, and highly poisonous. It can only be used in wooden barrels as it attacks metal. It is not pleasant to handle even in so weak a solution as that given. The writer cannot recommend its use when Formalin is available, in spite of the latter costing more. As a matter of fact the Formalin treatment is very inexpensive compared with the usual cost of fungicidal materials. By straining the liquid it can be used again and again, and the cost of the treatment, exclusive of labour, should not exceed a few shillings per acre. The best method is to have two dipping tanks, of suitable size, each fitted with a tap below so that the liquid can be run off when the soaking is finished without handling the tubers. The tubers should be soaked from $1\frac{1}{2}$ to 2 hours and they must not be put back into the infected sacks. It must be remembered that this treatment is only effective in giving a clean crop when the seed is planted in *ground free from the spores of the disease*. No known treatment will give a clean crop from infected soil.

NOTE FOR CORRESPONDENTS.

When addressing letters or parcels to technical officers of the Agricultural Department, correspondents are requested to make use of the officer's official title. Failure of this observance often leads to delay in replying since letters addressed unofficially may remain unopened owing to the officer's absence from headquarters.

Garden Calendar.

By N. L. KAYE-EDDIE.

THE FLOWER GARDEN.

November.—All seeds may now be planted. Annuals for January flowering should be sown, amongst which the following will be found to do excellently in this country: Balsam, Calliopsis, Centurias, Crysanthemum, Dianthus, Eschscholtzia, Marigold, Mignonette, Gallardia, Phlox, Nasturtium, Nigella, Verbena, and Zinnia. These are all hardy and may sown in the open either in beds or in the position desired for flowering. Advantage should be seized after each shower of rain during this month to keep the soil well worked and loose.

December.—Seeds of every description may be sown. Tender annuals should be covered until strong enough, with a light covering of grass to shelter them from heavy showers. This is one of the busiest months of the year, as most plants will require attention, weeding, training, staking, cultivating, etc. Plants ready for transplanting should be done at the earliest opportunity. This is a favourite time for sowing creepers and climbers, and those growing should be attended to and fastened up as new growth forms. Dahlias begin to appear, and should be staked immediately large enough and the soil kept stirred an inch or so deep around them, but this should not be continued after flowering has advanced. Carnations should be tied up to keep the flowers from the ground; if planted in rows an excellent plan is to put a strip of wire netting slightly doubled up between them. This gives them a more tidy appearance. Should roses show signs of mildew they should be immediately dusted over with a little sulphur.

VEGETABLE GARDEN.

November and December.—All vegetable seeds may be sown during these months. Tomatoes and early peas and beans should be staked. The soil should be kept loose and free from weeds, which now get troublesome.

Sow Pumpkin, Mealies, Peas and Potatoes.

Departmental Notices.

LECTURES FOR FARMERS.

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable, lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner but the suggestion of other themes is invited.

Agriculture.—Maize growing; Maize selection and maintenance of the breeding plot; Points of maize and maize judging, with demonstrations; Utilisation of granite vleis soils; Ground nut culture; Rotation crops for home use and for sale; Veld improvement by winter grasses; Production of foodstuffs for the mines; Ensilage; Fungoid diseases of maize and wheat; Wheat, oats, and lucerne under irrigation; The prospects of cotton culture in Southern Rhodesia.

Veterinary Hygiene.—Detection and prevention of disease; The care of livestock.

Livestock.—Judging of cattle according to breeds, and for beef, milk, and draught; feeding and kraaling of live stock; hints on the principle of cattle breeding.

Chemistry.—The principles of soil fertility; the principles of manuring; the value of lime in agriculture; chemistry of milk and its products (accompanied by demonstrations in milk testing).

Entomology.—Economic entomology on the farm; the role of insects and their allies in the transmission of disease; scale insects and fruit trees and methods for their control; insect pests and maize; enemies of the potato, insect and fungus; the value and objects of plant import and nursery regulations.

Irrigation.—Methods of applying water to land for irrigation; the measurement of water in connection with irrigation; canal irrigation; storage reservoirs; hints on the selection of sites and on the design of earthen and other dams; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, soils, crops, processes and kindred matters, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without any indication of where they are from, or why they were sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding speci-

mens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particular regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

CO-OPERATIVE EXPERIMENTS.

The below-mentioned seed will be available from October to January next for free distribution in small quantities under the terms of co-operative experiments to any bona-fide farmer in Southern Rhodesia. Seed is supplied f.o.r. Salisbury, on experimenters undertaking to forward a faithful report on the result of the experiments at the close of the season, on forms which will be supplied for that purpose. Supplies of seed are limited, and not more than five different kinds can be sent to one applicant.

All applications to be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury.

Leguminous Crops.—Lucerne, Egyptian clover, Soya beans, velvet beans, cowpeas, vetches, and lupines.

Summer Cereals.—Victoria wheat, Durum wheat, Bobs' rust-proof wheat, Gluyas wheat, dryland rice, Boer manna, Japanese millet, and Californian green moha.

Winter Pasture Plants and Grasses.—Sheep's burnet, cocks-foot, tall fescue, awnless brome grass, cowgrass clover,

perennial red clover, sheep's parsley, paspalum, and phalaris bulbosa slips and seed.

Oil and Fibre Crops—Ground-nuts, castor oil, linseed and cotton.

Root Crops.—Mangels, carrots, sugar beet, swedes, kohlrabi, and chicory.

Miscellaneous.—Saltbush, rape, sunflower, mustard, Teff grass, Rhodes grass, and silvery Ramie.

DESTRUCTION OF WILD CARNIVORA, ETC.

It is hereby notified for public information that rewards for the destruction of wild carnivora, etc., will be paid on the scale and conditions herein set forth.

2. Rewards will be paid as follows :—

For each lion	£5	0	0
For each leopard	1	0	0
For each cheetah	1	0	0
For each hyæna	0	10	0
For each wild dog	0	10	0
For each crocodile not less than 3 feet in length	0	10	0
For each baboon	0	2	6

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, of the district, within three months of the date upon which the animal is killed, on a solemn declaration on the prescribed form hereunto annexed.

4. In proof of destruction, applicants for rewards will be required to produce and surrender in the case of a leopard or cheetah the skin with the tail unsevered, and in the case of a hyæna, crocodile, wild dog or baboon the unskinned head. In the case of a lion to produce the skin and skull, the skull only to be surrendered.

5. The skins and heads surrendered for rewards shall become the property of the Government and shall be disposed of in such manner as may be decided on.

FORM OF DECLARATION.

I,.....do solemnly and sincerely declare that I did on the.....day of, and not before, shoot, trap, or poison (as the case may be)..... (describe the vermin for which the reward is claimed) in the district of.....within the boundaries of Southern Rhodesia, and that I am entitled to the reward offered by the Government.

And I make this solemn declaration conscientiously believing the same to be true.

.....
Signature.

Signed and declared at.....
this.....day of.....

Before me,

.....
Magistrate or Justice of the Peace.

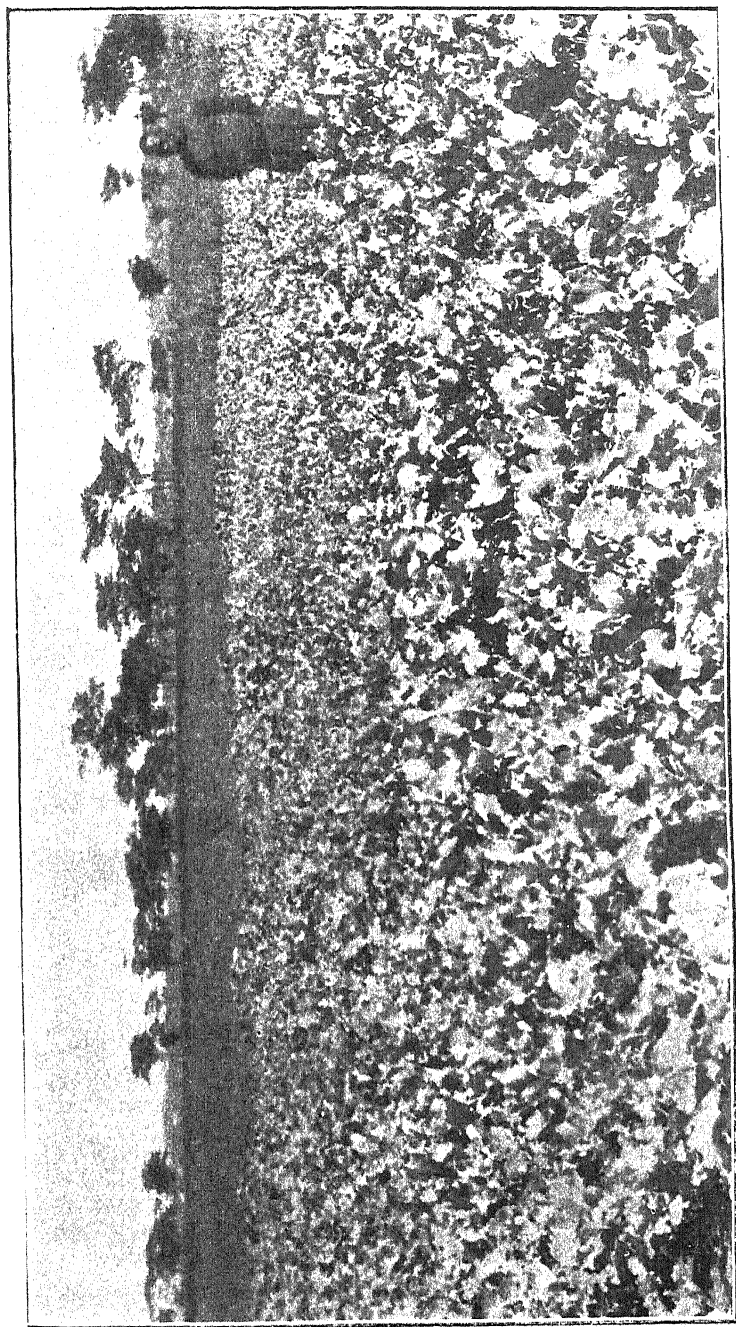
CHEMICAL ANALYSIS OF AGRICULTURAL PRODUCTS.

Arrangements have been made for the chemical examination of soils, limestones; grain, and other produce; oil-seeds, cream, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.



Broad-leaved Essex Rape. Botanical Experiment Station, Salisbury. Photographed May, 1911

SERVICES OF AGRICULTURAL ENGINEER.

It is hereby notified for public information that the services of Mr. W. M. Watt, Agricultural Engineer, are available to the public for the following purposes. Assistance may be obtained by farmers :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

LOANS FOR FENCING PURPOSES.

The B.S.A. Company is prepared to advance funds to any owner of a farm beneficially occupied by a white person, to provide fencing material, on the following conditions:

1. The full cost of the material at nearest station or siding will be advanced.
2. Payment shall be made in ten equal annual instalments, or less if the applicant desires, together with interest at 5 per cent. per annum, payable in July, but no repayment will be called for within one year of granting the loan.
3. The applicant will be required to furnish personal security to the satisfaction of the Fencing Loans Committee, or to pass a first mortgage bond over his farm as security for the loan.
4. The loan applies both to fences erected on the boundary of properties, and to internal fencing.

The loan will be made on completion of fence, and subject to inspection by a representative of the company.

The fence may be erected to any pattern approved by the Committee, but for guidance the following minimum requirements will normally be insisted upon :—

Straining posts not further than 440 yards apart; standards not further than 45 feet apart; droppers or lacing not further than four yards apart; if no droppers are used standards should not be more than 20 feet apart. If wooden strainers, standards or droppers are proposed to be used, the kind is to be specified.

Applications stating the situation and mileage, and furnishing specifications of fence proposed to be erected, and accompanied by firm and detailed quotations for the material required and cost at nearest station, must be addressed in the first instance to the Director of Agriculture, Salisbury.

Preference will be given to farmers in areas which have adopted Part I. of the "Fencing Ordinance, 1904," but all applications will be considered.

Farmers are invited to submit applications for the consideration of the Fencing Loans Committee to the Director of Agriculture, Salisbury.

SALE OF PASPALUM PLANTS.

Roots of this valuable winter pasture grass, suitable both for moist and dry situations, will be available for sale from December onwards at the rate of 5s. per 1,000 slips f.o.r. Salisbury. A root can be broken up into from thirty to fifty or more slips and, when ordering, the number of slips required should be stated. Applications, accompanied by remittance, to be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury.

FORESTRY.—SALE OF SEEDLING TREES.

It is anticipated that the undermentioned seedling trees will be available for sale from December onwards. The trees are grown on the Experiment Station, Salisbury, and will be sold at a price of 1d. each or 8s. 4d. per 100 f.o.r. Salisbury. With the exception of *Dalbergia sisso*, which is sufficiently hardy to be transplanted direct from the seed beds, the trees will be grown in tins and will be placed on rail in this condition. If required to be sent by Agricultural parcels post, they will necessarily have to be removed from the tins, but this method of forwarding is not recommended.

Orders must be accompanied by cheque or post office order for the necessary amount, and the Department is unable to reserve trees unless payment has been received. When it is desired that the trees be despatched to a Siding the amount of railage should also be remitted. Orders should be received at least seven days before the date on which despatch is desired and, after delivery of trees to the Railway Company, the Department can accept no further liability. Since Stocks are limited, application should be made early, and should be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury.

<i>Cupressus lusitanica</i>	...	Goa Cypress
„ <i>semper-virens</i>	...	Common cypress
„ <i>macrocarpa</i>	...	
<i>Dalbergia sisso</i>	...	Indian sisso

<i>Eucalyptus citriodora</i>	...	Lemon scented gum
<i>Eucalyptus ficifolia</i>	...	Red flowering gum
„ <i>polyanthema</i>	...	Red box gum
„ <i>rostrata</i>	...	Rostrata (Red) gum
„ <i>saligna</i>	...	Saligna gum
„ <i>robusta</i>	...	Swamp mahogany
„ <i>globulus</i>	...	Blue gum
„ <i>patentinervis</i>	...	
<i>Pinus canariensis</i>	...	Canary pine
„ <i>halepensis</i>	...	Aleppo pine
„ <i>insignis</i>	...	Monterey pine
<i>Robinia pseudacacia</i>	...	Locust acacia

HEDGE PLANTS.

<i>Abergia caffra</i>	...	Kei apple
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DIPPING TANKS.—GRANTS-IN-AID.

The Government is prepared to assist farmers in the construction of private dipping tanks by a grant-in-aid on the £ for £ principle, but not to exceed, however, a total sum of £50.

This grant will only be paid to approved applicants, and after the tank has been inspected by an official appointed for this purpose and found suitable, and on production of receipted accounts in support of their claim.

Farmers wishing to take advantage of this grant should apply to the Director of Agriculture, from whom full particulars can be obtained, together with plans and specifications of a suitable tank.

SERVICES OF TOBACCO EXPERT.

Mr. J. W. Lewis has been appointed Tobacco Expert to the Administration.

Farmers wishing to receive advice or instruction in the culture and curing of tobacco should app'y to the Director of Agriculture.

DEPARTMENTAL BULLETINS.

The following Bulletins on special subjects, consisting mainly of reprints of articles which have appeared in this

Journal, are available for distribution free of charge to applicants in Rhodesia:—

AGRICULTURE.

The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., LL.B.

Ensilage, by H. Godfrey Mundy, F.L.S.

The Conservation of Kraal Manure, by H. Godfrey Mundy, F.L.S.

Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S.

Requirements in sending Botanical Specimens to the Department for Identification.

The Use of Lime in Agriculture, by G. N. Blackshaw, B.Sc.

Agricultural Co-operation in Rhodesia, by P. J. Hannon.

Plans and Specifications of Flue Curing Barns.

Report of Forestry in Southern Rhodesia, by J. Sims, F.H.A.S.

Hints on Irrigation—Small Gravitation Schemes—by W. Martin Watt, Government Agricultural Engineer.

Fertility of Soils and Organic Matter, by G. N. Blackshaw, B.Sc., Government Agricultural Chemist.

Hints on Irrigation—Small Earthen Reservoir—by W. M. Watt.

Winter Cereals, by H. Godfrey Mundy, F.L.S.

CROPS.

How Maize can be made more profitable, by H. Godfrey Mundy, F.L.S.

Use of Maize as Forage, by R. H. B. Dickson.

Suggestions for Cotton Growers, by R. H. B. Dickson.

The Ground-nut or Pea-nut, by H. Godfrey Mundy, F.L.S.

Manuring of Tobacco on Mr. L. Black's Farm, G. N. Blackshaw, B.Sc., F.C.S.

Onion Growing, by H. Godfrey Mundy, F.L.S.

Possible Rotation of Crops for Southern Rhodesia, by H. Godfrey Mundy, F.L.S.

Maize Breeding and Seed Selection, by H. G. Mundy, F.L.S., Government Agriculturist and Botanist.

Chicory Growing, by H. Godfrey Mundy, F.L.S.

Flax-Linum Usitatissimum, by C. E. F. Allen.

Soy Beans, by R. H. B. Dickson.

ENTOMOLOGY AND VEGETABLE PATHOLOGY.

Onion Thrips, by R. W. Jack, F.E.S.

The Tsetse Fly, by L. E. W. Bevan, M.R.C.V.S.

The Relationship of Ticks and Disease, by R. W. Jack, F.E.S.

The Head Smut of Maize, by H. Godfrey Mundy, F.L.S.

Insect Friends of the Farmer, by R. W. Jack, F.E.S.

Citrus Psylla.

Root Gall Worm in Potatoes, by Rupert W. Jack, F.E.S.

Black Orange Aphis, by Rupert W. Jack, F.E.S.

Maize Stalk Borer or Mealie Grub, by Rupert W. Jack, F.E.S.

Regulations affecting the Importation of Potatoes. by Rupert W. Jack, F.E.S.

Selection of Spraying Outfit, by R. W. Jack, F.E.S.

Resin Wash and Means of Applying It, by R. W. Jack, F.E.S.

Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by W. Jack, F.E.S.

VETERINARY.

Bots in Equines, by R. Ferguson Stirling, M.R.C.V.S.

Accidents to Cows after Calving, by J. M. Sinclair, M.R.C.V.S.

African Coast Fever, by L. E. W. Bevan, M.R.C.V.S., (revised edition).

Notes on Bovine Plasmoses of Southern Rhodesia, with special reference to Mashonaland, by L. E. W. Bevan, M.R.C.V.S.

Strangles, by F. D. Ferguson, M.R.C.V.S.

Epizootic Abortion in Cattle, by L. E. W. Bevan, M.R.C.V.S.

The Construction of Dipping Tanks for Cattle.

Animals Diseases Consolidation Ordinance, 1904.

Difficult Parturition of the Cow, by C. R. Edmonds, M.R.C.V.S.

Common Ailments of the Horse, by D. R. Chatterley, M.R.C.V.S.

Detection and Prevention of Diseases of Stock, by L. E. W. Bevan, M.R.C.V.S.

African Coast Fever—Transport Cattle, by L. E. W. Bevan, M.R.C.V.S.

African Coast Fever—Diagnosis of Gland Puncture, by L. E. W. Bevan, M.R.C.V.S.

MISCELLANEOUS.

Terms for Analysis by the Department of Agriculture, of Products,
Soils, Water, etc.

Hints on Brickmaking, by G. S. Dyke.

Loans for Fencing.

Rural Education in Rhodesia, by G. Duthie, M.A., F.R.S.E.

Game Law: Summary of.

Services of Agricultural Engineer.

Lectures for Farmers.

Animals Diseases Amending Ordinance, 1911.

Special Railway Rates for Benefit of Farming Community.

Second Reports on Experiments—Experimental Station, Salisbury, 1910-1911,
by J. H. Hampton.

Importation of Plants Regulations.

Watering and Feeding of Live Stock on Railway.

Government Notices.

No. 248 of 1911.]

[20th July, 1911

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of clause 11 of Government Notice No. 45 of 1909 to be in force in native districts of Gwelo and Selukwe for a period of three months from date hereof.

No. 200 of 1911.]

[8th June, 1911

MOVEMENT OF CATTLE.

UNDER and by virtue of the powers invested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notice No. 34 of 1911, and in lieu thereof amend section 16 of Government Notice No. 329 of 1910 by the addition of the following clause:—

" Provided, however, that—

- (a) cattle in transit by rail;
- (b) imported cattle detained at a point within any such declared area for purposes of distribution, either immediately or after inoculation;
- (c) bulls for stud improvement purposes;

may be moved within and from any such declared area under the conditions of sections 5 and 6 hereof, and such other conditions as may be imposed by the Chief Inspector of Stock;

(d) and cattle intended for slaughter purposes may be moved under like conditions from one place in an affected area to another place in the same area, and there slaughtered."

No. 203 of 1911.]

[15th June, 1911.

GAME LAW CONSOLIDATED ORDINANCE, 1906.

UNDER and by virtue of the powers conferred upon me by the "Game Law Consolidation Ordinance, 1906, I do hereby extend the provisions of Government Notice No. 40 of 1909, as amended by Government Notices Nos. 128 and 129 of 1909, for a further period of one year from the 30th June, 1911.

No. 204 of 1911.]

[15th June, 1911.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of clause 11 of Government Notice No. 45 of 1909 to be in force within an area of 15 miles from Mr. T. C. de Klerk's homestead, on the farm Wonderklip, in the Charter district, for a period of six weeks from publication of this Notice.

No. 215 of 1911.]

[15th June, 1911.]

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidated Ordinance, 1904," I do hereby declare the provisions of clause 11 of Government Notice No. 45 of 1909 to be in force over an area within 15 miles of Lallapansi Siding, situated in the Gwelo district, for a period of six weeks from date of this Notice.

No. 218 of 1911.]

[15th June, 1911.]

BLACK QUARTER OR SPONSZIEKTE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," and the "Animals Diseases Amending Ordinance, 1911," I do hereby declare the farms Carlsville, Richardson's and Inkuku, in the district of Nyamandhlovu, to be actively infected with the disease known as Black Quarter or Sponziedade, for the purposes of the above Ordinances. Attention is drawn to sub-sections 3 and 4 of section 13 of the first-mentioned Ordinance, which is hereby published for general information.

Section 13 of Ordinance 9 of 1904.

"(3) The carcases of all animals destroyed under this Ordinance, or that may have died from any destructive disease, shall be forthwith burnt by the owner thereof, at the spot as nearly as may be where the death occurred, or shall be disposed of in accordance with orders given by any official duly authorised thereto by direction of the Administrator.

"(4) Any person disposing of, removing or attempting to remove, any part of an animal destroyed, burnt or buried, under the provisions of this Ordinance, shall be liable upon conviction to a penalty not exceeding Fifty Pounds, or, in default of payment, to imprisonment with or without hard labour for any period not exceeding three months, unless the penalty be sooner paid."

[25th April, 1911.]

PURCHASE OF BULLS BY GOVERNMENT FOR DISTRIBUTION TO FARMERS.

THE Government has arranged to purchase a limited number of Bulls in England, to be re-sold on arrival here to approved applicants in occupation of farms.

The animals are being selected from the Hereford, Sussex and milk Short-horn breeds. They will be about two years of age and old enough for service in October next. The average cost in England is expected to be £40. They will arrive in Salisbury about the end of July next, when they will be placed in charge of the Veterinary Department to tend and test. Approved applicants will be advised when the animals are ready, and will be expected to take immediate delivery.

TERMS.

The purchase price will include all expenses up to the time of delivery, price paid to original owner, commission and charges of buyer and shipper, freight (including attendance and keep on journey), expenses and keep during testing and inoculation up till time of delivery, and a departmental charge to meet administrative expenditure, but not insurance.

No farmer will be allowed to take more than one animal, and one-half of the purchase price must be paid on delivery to applicant, and the balance in six and twelve months, if the animals survive, but either of the latter instalments would be remitted should an animal die before due date. No animal to be disposed of without the written consent of the Director of Agriculture until payment is completed.

All applications should be addressed to the Director of Agriculture, and

should state the breed of animal required and signify agreement to the terms and conditions as stated above.

All applications will be considered in order of priority, but the Government reserves the right to refuse, without stating the reason, the acceptance of any application.

No. 154 of 1911.]

[9th May, 1911

AFRICAN COAST FEVER.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance of 1904," I do hereby declare the whole of the Native district of Bulawayo to be an area actively infected with the disease known as African Coast Fever.

AFRICAN COAST FEVER.

[25th May, 1911.

ATENTION is drawn to Government Notice No. 184 of 1911 defining certain areas wherein movement of cattle for draught purposes may be allowed subject to the provisions of Government Notice No. 329 of 1910.

Under Government Notices Nos. 14, 106, and 154 of 1911 certain portions of the country have been declared to be actively infected with African Coast Fever, where all movement of cattle is still prohibited.

The areas mentioned in the subjoined list include portions of infected veld, and no movement of cattle for draught purposes will be permitted within these until further notice.

No. 4 Fig:ree Area.

„ 5 Westacre Area.

„ 6 Bulawayo Area.

„ 7 Heaney Junction Area.

„ 8 Bembesi Area.

„ 10 Insiza South Area.

„ 20 Matopo Terminus Area.

„ 40 1654½-Mile Peg Area.

„ 41 Salisbury A Area.

„ 42 Salisbury B Area.

„ 43 Salisbury C Area.

„ 44 Salisbury D Area.

„ 47 Marandellas North Area.

„ 48 Marandellas South Area.

„ 50 Headlands Area.

„ 51 Junction Mazoe & Lomagundi Railway Area.

„ 52 23-Mile Peg Lomagundi Railway Area.

„ 53 Passaford Area.

F. J. CLARKE,

For the Director of Agriculture.

FENCING ORDINANCE, 1904.

NOTICE is hereby given that it is the intention of owners of landed property situated in Gwelo native district, as described below, to petition His Honour the Administrator to bring into force and apply the provisions of Part I. of the Fencing Ordinance of 1904 to the undermentioned area:—

From the Shangani River on the Bulawayo-Salisbury road, along this road to its intersection with the Gwelo commonage boundary; thence following

the south-western, south-eastern and eastern boundaries of the commonage till the Bulawayo-Salisbury road is again reached; thence along this road to its intersection with the south-western boundary of the Central Estates; thence in a north-westerly direction along the south-western boundary to the most western beacon of the said estates; thence along the north-western boundary of the estates to where it crosses the Sebakwe River; thence along this river to Hartley Hill road; thence along this road to the Umniati River; thence along this river to its junction with the Ngadoni River; thence along a line drawn to the north-east corner of the Shangani Native Reserve; thence along the eastern boundary of this reserve to where it is crossed by the Shangani River; thence along this river to the Shangani Drift on the Bulawayo-Salisbury road.

Dated at Gwelo, this 4th day of April, 1911.

For self and co-petitioners,

H. R. CUMMING.

No. 85 of 1911.]

[16th March, 1911.

IT is hereby notified for public information that the subjoined Ordinances entitled

"Additional Appropriation 1910-11 Ordinance, 1911,"

"Animals Diseases Amendment Ordinance, 1911," have been assented to by His Excellency the High Commissioner, and are hereby published in terms of the 36th section of the Southern Rhodesia Order in Council, 1898."

Ordinance No. 2, 1911.]

[Promulgated 17th March, 1911.

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. So much of the "Animals Diseases Consolidated Ordinance, 1904" (hereinafter referred to as the said Ordinance) and of any other law as may be repugnant to or inconsistent with the provisions of this Ordinance is hereby repealed.

2. The Administrator may, on the outbreak of a destructive disease, or when there is suspicion of the existence of such disease, declare an area around and including the place where such disease exists, or is supposed to exist, actively infected for the purpose of this Ordinance.

3. Whenever an area shall have been declared infected in terms of the last preceding section, the Administrator may, for the purpose of suppressing or controlling disease, cause such fences to be erected along the boundaries of or across any farms or land situated in such area as he may deem necessary.

4. (1) If the landowner shall not pay the cost of erecting any fence as aforesaid upon completion thereof, the cost shall be defrayed in the first instance out of moneys provided by the Legislative Council.

(2) When any fence erected as aforesaid runs along the boundary of a farm, the cost of the erection of such fence shall, if not sooner repaid, be repaid, together with interest at the rate of £5 per centum per annum, by equal yearly instalments commencing two years after the fencing is completed, such instalments being so calculated and fixed that the said cost and interest shall be wholly repaid within a period of fifteen years from the date when the first instalment became due.

(3) Such repayment shall be made by the adjoining landowners whose land has been divided by the fence. Each such landowner shall pay one-half the cost of the dividing fence and interest as aforesaid. When the adjoining land is a native reserve, or a portion of such reserve, the one-half of the cost shall be paid from funds in the local Treasury of the British South Africa Company.

(4) When any fence as aforesaid shall be erected within, and not on and along, the boundaries of any farm, the cost shall be paid from the funds of the local Treasury of the British South Africa Company, and the fence, when no longer necessary for the purpose for which

it was erected, may be removed by the British South Africa Company; provided that the landowner shall have the right to purchase such internal fence at a price representing the total cost of such fence.

- (5) The term "owner" shall mean (a) the person registered as such in the office of the Registrar of Deeds, (b) the British South Africa Company in respect of native reserves, and (c) the local authority in respect of municipalities.

5. Where the bed of a stream or river lies immediately between or constitutes the boundaries of land owned by private owners, the fence may be erected on one or other bank of the river or stream and across it, or partly on one bank, across it, and partly on the other bank, in such manner as may be agreed upon by the owners whose lands are separated by the said stream or rivers. The Administrator may call upon the said owners to agree to the position of the said fence on or before a date fixed by him, and should they fail to do so, he may cause such fence to be erected without further reference to the said owners. For the purposes of repayment, such fence shall be considered as dividing the lands of adjoining owners, and half the cost shall be recoverable from each owner whose lands are separated by the said stream or river.

6. The Administrator may call upon any owner whose land has been fenced in terms of section 3 or 12 to provide sufficient security for the payment of any sums that may be due to the British South Africa Company in its local Treasury in respect of such fence. If the owner shall fail or refuse to provide such security, the Administrator may cause a notice in writing to be sent to the Registrar of Deeds of the amount due by such owner, and the Registrar shall make an entry thereof in respect of the land fenced. Such entry shall constitute an hypothecation of the land, ranking from the date on which the entry was made and for the amount therein stated; provided that the Registrar may pass transfer of land so hypothecated if the transferee agrees in writing that any sum due and unpaid shall remain and be registered as a charge against the said land.

7. When any land held under lease or permit of occupation has been fenced in terms of this Ordinance, during the term of such lease or permit the lessee or permit holder shall pay to the proprietor of such land yearly, during the continuance of the lease or permit of occupation, interest at the rate of £5 per centum upon so much of the cost of the fence as the proprietor is liable for, and such payment shall be made with the rent of the land, and shall be deemed in law to be part of such rent.

8. Any tenant or holder of land under a permit of occupation having a right to purchase such land at a fixed price shall, on completion of the purchase, pay to the proprietor, in augmentation and as part of the purchase money, any sum paid by such proprietor for the fencing of such land, and shall become and be liable to repay to the British South Africa Company in its local Treasury such sums as remain unpaid, as the same become due and payable in terms of this Ordinance.

9. Where in the case of any local authority the title to land provides that upon the sale thereof the British South Africa Company shall be entitled to receive a proportion of the purchase price, the local authority shall be entitled to deduct from the purchase price of land sold any debt due or amount paid by it in respect of fences on the land so sold erected under this Ordinance.

10. The provisions of sections 14 and 15 of the "Fencing Ordinance, 1904," in regard to repairs shall, *mutatis mutandis*, apply to fences erected in terms of this Ordinance.

11. Where a fence crosses any road used as of right by the public or by any neighbouring landowner, a properly constructed swing gate shall be placed at the point of crossing.

12. Any person opening such gate, except for the purpose of passing through, or omitting to close such gate after having passed through, and any person damaging such gate and omitting to immediately repair such damage, shall be liable to a fine not exceeding £10, or in default of payment to imprisonment with or without hard labour for a period not exceeding one month.

13. The Administrator may, for the purpose of the more effective prevention or control of disease, apply the provisions of this Ordinance in respect of fencing to municipalities and townships and such land adjoining as may be deemed expedient, and to places within a radius of ten miles of an area declared actively infected in terms of section 2 hereof, if, owing to the number of cattle in such places, or other causes, it appears expedient.

14. (1) The owner or proprietor of the land along the boundaries of which fences have already been erected by the British South Africa Company for the purpose of preventing the spread of African Coast Fever in cattle shall be and is liable to repay to the British South Africa Company in its local Treasury one-half of the cost of so much of the fence as may be along the boundary of such land. The provisions of sections 7 and 8 of this Ordinance shall apply in the case of land held under lease or permit of occupation along the boundaries of which fences have already been erected. The British South Africa Company may remove any such fence already erected which is within and not on or along the boundaries of any land when no longer necessary for the purposes for which it was erected.

(2) Any payment due in respect of any such fence may be made as provided by section 4 of this Ordinance, and under the like conditions as to security for such payment as are prescribed under section 6.

15. Within any area declared by the Administrator to be actively infected under the provisions of section 2, or to which the provisions of this Ordinance shall have been applied in terms of section 12, the Administrator may, for the purpose of more effectively preventing the spread of disease, cause to be constructed on any land a dipping tank and any structures incidental thereto or other appliances for the dipping of stock, and may recover the expenditure incurred from the owner of the land on which such tank, structures or appliances have been constructed. The cost of such tanks, structures or appliances shall be paid on the same terms and under the same conditions as are applicable to boundary fences under sections 4, 6, 7 and 8 of this Ordinance.

16. In addition to any penalties that may be imposed under the said Ordinance or any amendment thereof, or under any regulations framed thereunder for the unlawful movement of cattle, the Court of the Magistrate before which the case is tried or the High Court in the like instance may direct the confiscation of any cattle unlawfully removed, and such cattle, if infected with disease or likely to convey infection, shall be destroyed without compensation. Should there be no danger of infection the Administrator may order such cattle to be temporarily kept at any spot denoted by him and then sold. The proceeds of any such sale shall be paid to the British South Africa Company in its local Treasury.

17. Section 11, sub-section (1) of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section :—

“Should any Inspector, Sub-Inspector or any person specially authorised by the Administrator to carry out the provisions of this Ordinance know or suspect that any animal is infected with any destructive disease, such Inspector, Sub-Inspector or other authorised person may forthwith place such animal in quarantine, together with such land as is necessary, for its isolation, and such animals as have been or are suspected of having been in contact with such animal or with infection. Notice of such quarantine shall be given in writing to the owner or custodian of such animal and to the Magistrate of the district, and shall remain in force for such time as the Chief Inspector or Controller of Stock may direct, unless the Administrator shall sooner, if he thinks fit, issue the notice referred to in sub-section (2) of section 5. A copy of the notice of any such quarantine shall be posted at the office of the Magistrate, and shall be inserted by the Magistrate in some newspaper, if any, circulating in the district.”

18. Section 16 of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Any Government Veterinary Surgeon or any person thereto authorised by the Controller of Stock, Chief Inspector or by a Magistrate may enter any land, building, kraal or enclosure for the purpose of inspecting animals. Should any animal be found to be infected with any destructive disease, or should such infection be reasonably suspected, he may quarantine such animals as in this Ordinance provided, and may order the proper disinfection of any building, kraal or enclosure in which such animal is or may recently have been, and the furniture and fittings thereof. Should it be impossible to properly disinfect such stable, kraal or enclosure, furniture or fittings in any of them, he may order the destruction thereof; provided that no building, kraal or enclosure shall be destroyed unless the owner consents thereto in writing, or, failing such consent, the Administrator orders that such destruction be carried out.”

19. Section 22, sub-section (1) of the said Ordinance is hereby amended by the addition of the following words after the word “obtained” in the twelfth line of the said sub-section, “and any person receiving or taking delivery of any animals without having ascertained that such permit has been obtained.”

20. This Ordinance may be cited as the “Animals Diseases Amending Ordinance, 1911,” and shall be read as one with the “Animals Diseases Consolidation Ordinance, 1904,” and the “Animals Diseases Amendment Ordinance, 1910.”

No. 295 of 1908.]

[1st October, 1908.

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the “Animals Diseases Consolidation Ordinance, 1904,” I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed existence of destructive diseases affecting the said animals in the said countries:—

- (1) All animals from the island of Mauritius.
- (2) All animals from German South-West Africa and all animals except donkeys from German East Africa.
- (3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.
- (4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.
- (5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingswilliamstown, Komgha, Peddie, Somerset East, Stockenström, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

(1) Plumtree shall be regarded as the port of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Office at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detrained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of Melsetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sawerombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about 2½ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed Block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roads distant, bounded north-westwards by a line about 1,350 roads in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roads in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly

known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary line of the Penhalonga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I,
residing at
in the district ofin the
.....Colony, do solemnly and sincerely
declare that the animals enumerated below are free from any contagious
disease, including scab, and have not been in contact with any infected
animals within six months from date hereof, and that to the best of my
knowledge and belief such animals in travelling to* Station
will not come in contact with any animals amongst which scab or any
other contagious disease has existed during that period; further, that
such animals were thoroughly disinfected by dipping on.....
and will enter Southern Rhodesia within ten days of having been
dipped.

And I make this solemn declaration conscientiously believing the same
to be true.

Declared to at on this day
of before me.

Resident Magistrate, Government Veterin-
ary Surgeon, Scab Inspector, or Police Officer
of district from which animals are being
sent.

Number and general description of animals being sent

Owner's name and Address

Place in Southern Rhodesia to which animals are being sent

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION I, GOVERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including scab, and to the best of my knowledge and belief have not been in contact with any infected animals nor come from, or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date.....

Place.....

.....
Signature of Government Veterinary Surgeon.

Number and general description of animals.....Pigs,Sheep,
.....Goats.

Place from which animals are to be sent.....

Owner's Name and Address.....

Place in Southern Rhodesia to which it is desired to send the animals
.....

No. 110 of 1908.]

[16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
- (2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
- (4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.
- (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcasses thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.

- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.
2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—

- (1) Importation shall be through and direct from the Coast Ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
- (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
2. Number and Class of cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
4. Area or Farm and District to which Cattle are to be moved.....
- Applicant's Signature.....

Date

Application

Permit No.

ANNEXURE "B."

I,.....
residing on the farm
in.....do solemnly and sincerely
declare that the..... (number in
writing) animals also enumerated below have been in my possession since
birth, and that lung-sickness, pleuro-pneumonia or other contagious or
infectious disease has not existed amongst any of my cattle, nor on my farm,
nor among any cattle with which these animals have been in contact within
the last four years, and that these animals have never been exposed for sale
in any public market or stock fair, nor been in contact with strange cattle,
and that to the best of my knowledge and belief such cattle in travelling to
.....Station (*i.e.*, station where cattle are to be
trucked) will not come into contact with any animals amongst which lung-
sickness or any other contagious or infectious disease has existed during that
period.

Number of Animals.....Bulls..... Heifers.....
Breed.....

Seller's Name and Address.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent
.....

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at.....on this.....
day of.....before me,

Resident Magistrate for the district of
.....

No. 60 of 1911.]

[23rd February, 1911.

IMPORTATION OF SHEEP AND GOATS FROM THE CAPE OF GOOD HOPE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section 1 of the Regulations published under Government Notice No. 295 of 1908 by the insertion of the words "or Examiner of Stock" immediately after the word "officer" where it occurs in the said section.

No. 60 of 1909.]

1st April 1909

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal Government Notice No. 124 of 1908, and do hereby declare and make known that, notwithstanding anything to the contrary elsewhere provided, the importation of cattle for bona fide slaughter purposes may be permitted into the Untali district from the adjoining Portuguese territory, under the following terms and conditions:—

- (1) The importation and disposal of cattle, introduced in terms of these regulations, shall be under the absolute control and direction of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.
- (2) The importation shall be by rail only, and all cattle shall be de-trucked at the slaughter enclosure and immediately confined therein.
- (3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."
- (4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

- (5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.
- (6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.
- (7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

No. 45 of 1909]

[13th March, 1909

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 136 and 225, of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcases of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

No. 249 of 1908]

[27th August, 1908

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

(a) Birds and Small Buck.

(b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tsessebe, Waterbuck and Wildebeest.

- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 160 of 1910, withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1911, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Butawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the landowner.

No. 391 of 1908]

[17th December, 1908

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdraw the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next

in order, according to the following table:—

- i. Off Neck or Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

- i. Off Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

- i. On Near Side or Ribs;
- ii. Near Rump (or Thigh);
- iii. Off Shoulder;
- iv. Off Side or Ribs;
- v. Off Rump (or Thigh).

(d) In the case of ostriches:—

- i. On Near Thigh;
- ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette".

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

No. 52 of 1909]

[25th March, 1909]

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEON'S SERVICES ARE AVAILABLE TO THE PUBLIC.

ON and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge for the following purposes:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-

rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lung-sickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases:—

Horsesickness, Lung-sickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz.:—

	£	s.	d.
(1) For every professional visit within three miles of his office or residence	0	5	0
(2) For every professional visit beyond such distance	0	10	6
plus an additional charge of 2s. 6d per hour whilst engaged in such visits, or £2 2s. a day of 24 hours;			
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees:—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each	1	1	0
c. " bulls "	0	5	0
d. " donkeys "	0	10	6
e. For parturition cases, mares, each	2	2	0
f. For parturition cases, cows, each	1	1	0
g. For other operations, according to nature, from 5s. to £2 2s.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive

in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

No. 309 of 1909]

[30th December, 1909

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from overseas, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expense of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

No. 263 of 1909]

[25th November, 1909.

IMPORTATION OF SWINE.

NOTWITHSTANDING the prohibition which exists under section 1 sub-section 3 of Government Notice No. 295 of 1908 against the importation of swine from the Colony of the Cape of Good Hope, I, under and by virtue

of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide that swine may be imported from the Cape of Good Hope under a permit issued by the Chief Inspector or Examiner of Stock, and subject to any examination and quarantine on entry that may be necessary, and to such other conditions as may be deemed expedient to attach to such importations.

No. 211 of 1909.]

[16th September, 1909.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—

Grass	Straw
Hay	Lucerne Hay
Forage	Green Lucerne
Sugar Cane	

or any other bedding or fodder plant.

No. 264. of 1909]

[25th November, 1909

IMPORTATION OF HIDES.

NDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of horns and raw hides of cattle from the Bechuanaland Protectorate.

Any horns or hides introduced in contravention of this prohibition shall be confiscated and destroyed.

No. 79 of 1910]

[7th April, 1910

NDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby direct that all cattle found within an area of twenty miles of the Crocodile River, in the native districts of Tuli and Chibi, in contravention of the provisions of Government Notice No. 47 of the 10th March, 1910, shall be forthwith destroyed.

No. 142 of 1910]

[16th June, 1910

AFRICAN COAST FEVER.

NDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the movement of cattle within the native districts of Umzingwane, Matobo and Insiza, and all permits issued in respect of these districts, and now current, are hereby cancelled.

No. 127 of 1910.]

[2nd June, 1910.

IMPORTATION OF CATTLE FROM NORTH-EASTERN RHODESIA AND NYASALAND.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that the importation of cattle from North-Eastern Rhodesia and Nyasaland may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle be first had and obtained.
2. All cattle shall be introduced by way of the town or port of Feira, which is hereby declared a port of entry.
3. All applications for permission to import shall be accompanied by

[1] A certificate by a Government Veterinary Surgeon of the territory of origin that

- a. the districts from which they come and through which they pass are free from contagious diseases of animals;
 - b. the animals in respect of which the application is being made have been examined and are free from any destructive disease.
- [2] A certificate from a Government Veterinary Surgeon of North-Eastern Rhodesia, with respect to cattle from Nyasaland, that the districts of North-Eastern Rhodesia through which they have passed are free from contagious diseases of animals.
- Provided, however, that until the Government of Nyasaland obtains the services of a qualified Veterinary Surgeon the certificate of a District Commissioner as to [1] a. and the certificate of a Government Veterinary Surgeon of North-Eastern Rhodesia as to [1] b. shall be accepted.
4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.
 5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.
 6. Any person found introducing cattle in contravention of these regulations or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

SCHEDULE "A."

1. CERTIFICATE UNDER SECTION 3. [1], a.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers.
Calves,
Oxen and Bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature.....
 Government Veterinary Surgeon
 (or District Commissioner, Nyasaland).

2. CERTIFICATE UNDER SECTION 3. [1], b.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,
Calves,
Oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....
 Government Veterinary Surgeon.

CERTIFICATE UNDER SECTION 3. [2].

I hereby certify that the following cattle belonging to Mr.....

.....Cows and heifers,
Calves,
Oxen and bulls,

in transit from Nyasaland to Southern Rhodesia, will not traverse any area infected with a destructive disease of cattle.

Signature.....
 Government Veterinary Surgeon.

NOTE.—Cattle from North-Eastern Rhodesia require Certificates Nos. 1 and 2.

Cattle from Nyasaland require Certificates Nos. 1, 2 and 3.

No. 245 of 1910.]

[8th September, 1910.

MOVEMENT OF CATTLE: GOROMONZI NATIVE DISTRICT.

NDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend Government Notice No. 168 of 1910, section (2), by the insertion of the following clause:—

- (e) transport cattle for the purpose of mine supplies within an area comprising the farms—

Mount Shannon	Cromlet	Learig	Alderley
Rudolphia	Gardiner	Mabfen	Kilmuir
Guernsey	Gilnochie	Grazelley	Thornvlei

No. 211 of 1910]

[4th August, 1910.

IMPORTATION OF CATTLE FROM NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

- (a) the districts from which they come and through which they pass are free from contagious diseases of animals;
- (b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to

import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for.

ANNEXURE "A."

Certificates under Section 3.

(a) I certify that I have examined the following cattle belonging to Mr.

.....cows and heifers,
calves,
oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....

Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr.

.....cows and heifers,
calves,
oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....

Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

No. 229 of 1910]

AFRICAN COAST FEVER.

[17th August, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel so much of Government Notice No. 142 of 1910 as prohibits the movement of cattle in the native districts of Matobo and Insiza.

No. 223 of 1910.]

IMPORTATION OF ANIMALS.

[18th August, 1910.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of animals and dogs from the following countries:—

Persia
 British Burmah
 Assam
 China and bordering countries, including Korea
 French Indo-China
 Dutch East Indies
 Hong Kong
 Federal Malay States
 The Philippines
 Zanzibar

and all other countries where surra is known to exist.

No. 254 of 1910.]

[22nd September, 1910.

SOUTHERN BOUNDARY.

UNDER and by virtues of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

1. All cattle within an area of twenty miles from Shashi and Ramaquabane Rivers in the native districts of Tuli-Manzamyama and Bulalima-Mangwe, save and except westwards of the south-eastern boundary of the Mphoeng's reserve, shall, within one month from date hereof, be removed therefrom by the owners to such place or places as shall have been approved by the Native Commissioners of the said native districts respectively.

2. The introduction of all cattle into the aforesaid area is prohibited.

3. Any person refusing or neglecting to remove cattle from the area, as herein provided or introducing cattle into such area, shall be liable to the penalties provided by the aforesaid Ordinance, and all cattle found in the said area in contravention of this Notice shall forthwith be destroyed.

No. 51 of 1911.]

[16th February, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section 1 of the Regulations published under Government Notice No. 254 of 1910, by omitting the words "an area of twenty miles from the Shashi and Ramaquabane Rivers," and substituting the words "an area bounded by a line from the junction of the Shashi and Shashani Rivers and continuing up the former river, following the borders of the Territory to the most southern beacon of Mphoeng's Extension Reserve, thence along the eastern boundary of the Reserve to a point shortly south of the south-west beacon of the farm "Lewisdale," thence south-easterly and easterly along a demarcated line to the junction of the Bulawayo-Maccloutsi road and Bulawayo-Tuli old road, and thence along the latter to the Shashani River and down this river to the starting point."

No. 240 of 1910.]

[1st September, 1910.

INSECT PESTS.

UNDER and by virtue of the powers vested in me by the "Nursery Ordinance, 1909," I hereby proclaim the undermentioned insects to be pests within the meaning of the said Ordinance:—

- The Red Scale (*Chrysomphalus aurantii*)
- The Oleander Scale (*C. hederæ*)
- The Circular Purple Scale (*C. aspidium*)
- Ross's Black Scale (*C. rossi*)
- The Purple or Mussel Scale (*Lepidosaphes beckii*)
- The Long Scale (*L. gloverii*)
- The White Peach Scale (*Aulacaspis pentagona*)
- Woolly Aphis or American Blight (*Schizoneura lanigera*).

No. 329 of 1910.]

[15th December, 1910.

AFRICAN COAST FEVER.

REGULATIONS regarding the movement of cattle and the prevention and suppression of disease.

1. Under and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw

Government Notices Nos. 268 of 1907, 356 of 1908, 39 of 1909, 216 of 1909, 281 of 1909 and 202 of 1910, and make the following provisions in lieu thereof,

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

General Movement.

3. For the purposes of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission:—

- (a) single farms;
- (b) an area, the property of one owner, enclosed by a substantial fence;
- (c) an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land. The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission in writing of an inspector, sub-inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall be issued—

- (a) without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the District, over which land or reserve such cattle shall pass, whether along roads or otherwise; provided, however, that if the Chief Inspector or Controller of Stock shall consider that such consent is withheld without good and sufficient cause, he may issue a permit of removal without such consent;
- (b) for the removal of cattle from one native district in Matabeleland to or through another without the approval of the Government Veterinary Surgeon at Bulawayo;
- (c) from any native district to or through another without the consent of the Native Commissioner of such other district.

Slaughter Cattle.

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose, and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same, except for the purpose of being slaughtered at the appointed abattoir; and, if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock.

Transport Cattle.

9. From and after the 31st March, 1911, the use of cattle for draught purposes is prohibited, except within the boundaries of the places defined in section 3, unless permission shall have been obtained in terms of section 12 hereof.

10. It shall be competent for the owners or occupiers of contiguous farms jointly to petition the Administrator in writing for permission to employ cattle for draught purposes between the said farms and a point on the railway line or other centre. The Administrator, on receiving a petition as aforesaid, may cause a notice to be addressed, either by publication in a newspaper or in such manner as may be deemed expedient, to persons owning or occupying farms adjoining those of the petitioners, and farms over which the said petitioners desire to pass to the aforesaid railway or centre. Such notices shall call upon the persons to whom they are addressed to lodge their objections (if any) to the petition being acceded to, and shall fix a date by which such objections must be received. Forms of petition or objection shall contain particulars of the number and value of the cattle on the farms represented by the petitioners and objectors respectively.

11. On the expiration of the period fixed for the receiving objections as aforesaid, the Administrator shall consider the petition and the objections thereto, and make such decision thereon as may appear expedient.

12. Whenever the Administrator shall have acceded to a petition as aforesaid, permission in writing may be granted by such persons as are mentioned in section 5 hereof for the use of cattle for draught purposes within the area comprising the farms representing the petitions and objectors, and between such area and the point or centre mentioned in the said petition.

13. Permission in writing may be granted by such persons as are mentioned in section 5 hereof for the working of cattle in connection with mines; provided such working is confined to an area such as is provided for in section 12 hereof.

14. Persons engaged in the working of mines not situated in areas as aforesaid may apply to the Administrator for permission to employ cattle for draught purposes in a specified area around such mines, or between such mines and on a point on a railway or other centre, and the Administrator, on receipt of such application, shall consider the same, and may call for objections thereto, and thereafter make such order thereon as he may deem fit.

15. Notwithstanding the provisions of sections 12, 13 and 14, no permit shall authorise the working of cattle—

- (a) in any area declared to be actively infected in terms of section 16 hereof;
- (b) which are not clearly and distinctly branded with the registered brand of the owner;
- (c) in any wagon or vehicle, which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

General Provisions.

16. On the outbreak or suspected outbreak of disease, the Administrator may declare an area around and embracing the place of outbreak or suspected outbreak to be actively infected, whereupon all movement of cattle from place to place within such area shall be immediately suspended. The removal of green forage, hay, fodder, bedding, reeds, manure, or of such other articles as may reasonably be supposed capable of conveying infection shall be prohibited from such area, save and except with the special permission of the Administrator.

17. Whenever an area shall have been declared actively infected in terms of section 16 hereof, every person within such area, or within such further area as may be specified, owning or in charge of cattle shall, upon the death of any such cattle, immediately report the death to the nearest Cattle Inspector, Native Commissioner, or Police Officer, and shall also, if a European, render to any such official, not later than the tenth day of each month, a return in the form hereunto annexed, shewing the number of cattle in his possession on the last day of the preceding month, any increase or decrease of the number of cattle during such month, and a statement as the cause of such increase or decrease. Such returns shall, in the case of natives, be made verbally to the Native Commissioner or other duly authorised official.

18. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

19. All cattle within the limits of the various commonages and town-lands, or depastured on common grazing ground, shall be dipped or sprayed at least once in every fourteen days, unless the Chief Inspector shall, for sufficient reason, authorise the suspension of such dipping or spraying.

20. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Cattle Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier, or manager and the said native owners.

21. All permits for the removal of cattle issued under the provisions of the said Ordinance, or of any regulations framed thereunder, shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks, or unless they have been effectively cleansed by dipping, spraying, or other process within fourteen days of being allowed on such road or other place.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

ANNEXURE.

AFRICAN COAST FEVER.

Return of Cattle for month ending.....19.....

No. of Cattle.	Increase during month.	Decrease during month.
Cows.....
Bulls.....
Oxen.....
Young Stock.....
Calves.....
Cause of decrease.....
Cause of increase.....
Name of farm.....

(Owner's Signature.)

No. 33 of 1911.]

[2nd February, 1911.]

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby, in accordance with section 16 of Government Notice No. 329 of 1910, declare the following areas to be actively infected with the disease known as African Coast Fever:—

Farm Hayden,	Goromonzi district.	
Farm Tilbury,	Melsetter district.	
Farm Aberfoyle,		} Selukwe district.
Farm Brooklands,		
Farm Riversdale,		

No. 59 of 1911.]

[23rd February, 1911.]

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," and in accordance with section 16 of the Regulations published under Government Notice No. 329 of 1910, I do hereby declare the whole of the native district of Matobo to be an area actively infected with the disease known as African Coast Fever.

No. 34 of 1911.]

[7th February, 1911.]

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section 16 of Government Notice No. 329 of 1910, by the addition of the following clause:

"Provided, however, that cattle intended for slaughter purposes may be removed to a centre of consumption under the conditions of section 6 hereof, and under such other conditions as may be prescribed by the Chief Inspector of Stock."

No. 14 of 1911.]

[12th January, 1911.]

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 163, 281 and 336 of 1910, and in accordance with section 16 of Government Notice No. 329 of 1910 do hereby declare the following areas to be actively infected with the disease known as African Coast Fever:—

1. (a) The following farms and all adjoining farms in the native district of Goromonzi:—

Stamford,	Gillingham,	Fontainebleau,
Homefield,	Outspan,	Gletwyn,
Rainham,	Park Ridge,	Salisbury Commonage.

The following farms in the native district of Mazoe and all adjoining farms in the native districts of Mazoe and Goromonzi:—
Bitton, Syston.

(c) The following farms in the native districts of Marandellas and Goromonzi:—

Rockery,	Rakodzi,	Glensommers,
Longlands,	Springvale,	Elmswood,
Progress,	Retreat,	Rusawi Outspan,
Revolt,	Uplands,	Lottie.

- (d) The native district of Inyanga.
- (e) The native district of Makoni.
- (f) The native district of Umzingwani.
- (g) The following farms in the native district of Insiza:—

Centrebank,	York,	Kildare,	Lincoln,
Woodhouse,	Kogha,	Eldorado,	Bonnybrook,
Fairview,	Outspan No. 3,	Lancaster,	Blagdon,
Idutwa,			

2. The following area is defined for the purposes of section 17 of the said Notice, viz.:—That portion of the native district of Goromonzi lying west of and including the following farms:—

Borrowdale, Springs, Stuhm, Chishawasha, Hartmanns, Caledonia, Sebastopol, thence down the Ruua River to the Hunyani River.

3. Sections 16 and 17 of Government Notice 329 of 1910 are reprinted hereunder for general information:—

"16. On the outbreak or suspected outbreak of disease, the Administrator may declare an area around and embracing the place of outbreak or suspected outbreak to be actively infected, whereupon all movement of cattle from place to place within such area shall be immediately suspended. The removal of green forage, hay, fodder, bedding, reeds, manure, or of such other articles as may reasonably be supposed capable of conveying infection shall be prohibited from such area, save and except with the special permission of the Administrator.

"17. Whenever an area shall have been declared actively infected in terms of section 16 hereof, every person within such area, or within such further area as may be specified, owning or in charge of cattle shall, upon the death of any such cattle, immediately report the death to the nearest Cattle Inspector, Native Commissioner or Police Officer, and shall also, if a European, render to any such official, not later than the tenth day of each month, a return in the form hereunto annexed, shewing the number of cattle in his possession on the last day of the preceding month, any increase or decrease of the number of cattle during such month, and a statement as to the cause of such increase or decrease. Such returns shall, in the case of natives, be made verbally to the Native Commissioner or other duly authorised official.

No. 288 of 1911.]

[7th September, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend Section 1 of Government Notice No. 14 of 1911 by the deletion of the word "Gletwyn" in sub-section (a) and the cancellation of sub-sections (b) and (g).

No. 301 of 1911.]

[28th September, 1911.

UNDER and by virtue of the powers in me vested by the "Fencing Ordinance, 1904," it is hereby notified for general information that the provisions of the said Ordinance shall, in terms of Sections 3 and 4, Part I., be brought into force and applied to the native district of Gwelo, excluding the township of Gwelo, as from the 30th day of September, 1911.

No. 302 of 1911.]

[28th September, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend the Regulations framed under Government Notices Nos. 106 and 154 of 1911 by excluding the following farms from the operation thereof:—

The farms Honeybird Kop, Pendennis, Welcome and Vreigevecht, situated in the native districts of Matobo and Bulawayo.

No. 303 of 1911.]

[28th September, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," and the "Animals Diseases Amending Ordinance, 1911," I do hereby declare the following areas (for transport cattle, published under Government Notice No. 184 of 1911) to be actively infected with the disease known as African Coast Fever, for the purposes of the said Ordinances.

DESCRIPTION OF AREAS.

7. *Heaney Junction.*

An area including the following farms: Maxim Hill, Three Fountains, Driehoek, Malded, Imbeza Block, Springs, Hope Valley, Duncal, Kirton and Wilsondale.

8. *Bembesi Station.*

An area bounded by the Heaney Junction and Bulawayo areas as far as the Farm Kennebec; thence along the western boundaries of Kennebec, and by and including the farms Kennebec, Galeta's Kraal, and Umgusa Block; thence along the north-eastern boundaries of Winter, Spring, and Eland, to the south-western beacon of Westland Row; thence along the western boundaries of Westland Row, Bembezaan, and Westgate; thence by and including Goodwood Block, Gourlay's Block, Crescens Syndicate Block, Lavender Grange, Dromoland, Oscardale, Half Ration Rancho, Wessels, Greenlands, Lochard Block, Rouseville, Inyozan, Fochabers sub-division A, Kodhwayo, Zimbili, and Victory.

No. 304 of 1911.]

[28th September, 1911.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of Clause 11 of Government Notice No. 45 of 1909 to be in force in the native districts of Gutu and Victoria.

[31st July, 1911.

FENCING ORDINANCE, 1904.

NOTICE is hereby given that it is the intention of owners of landed property situated in the district of Figtree as described below, to petition His Honour the Administrator to bring into force and apply the provisions of Part I. of the Fencing Ordinance of 1904 to the undermentioned area.

DESCRIPTION OF AREA.

That portion of the district of Figtree within the following boundries:—

From the north-west beacon of the farm Peace along the northern and north-eastern boundaries of this farm, the Seventh Day Adventists' Mission Station and Springfontein; thence along the northern boundary of Paul's Rest, the northern and eastern boundaries of Pendennis and Honey Bird Kop, the northern boundary of Vreigevecht, the northern, eastern and southern boundaries of La Concorde; thence along the eastern boundaries of Outspan No. 3, Tati Road and D'Hoop, the northern and eastern boundaries of Forwards, the eastern and southern boundaries of Ravenswood, the south-eastern and south-western boundaries of Edenvale, the south-western boundaries of Wilton, Stretton and Sandown South and Peace to the north-western beacon of the latter farm.

FENCING ORDINANCE, 1904.

NOTICE is hereby given that it is the intention of owners of landed property situated in the vicinity of Gatooma, in the Hartley district, as described below, to petition His Honour the Administrator to bring into

force and apply the provisions of Part I of the Fencing Ordinance of 1904 to the undermentioned area:—

From the north-western beacon of Sabonabon Farm, near to the railway, along the boundary in an easterly direction of Sabonabon, Lanteglos and Lanteglos East farms, to the most easterly beacon of the last-named farm; thence in a southerly direction along the boundaries of Lanteglos East, Lanteglos Hope, Blue Ranges, Hillside and Bennett's farms to a beacon near to the Umsweswe River; from Umsweswe River in a northerly direction along the boundary of Bennett's, Hillside, to the northerly beacon of Blue Ranges, then north along Government Reserve boundary to a beacon near the railway east of Gatooma station; thence from beacon of Mornington farm east of Gatooma station, along the western boundaries of Mornington, Dr. Coke's, Half-way, to the most westerly beacon of Cloanmorna farm, and from this point north as far as the most northerly beacon of Lion Hill farm, and from this point in a southerly direction to the beacon of J. Mack's farm near the railway and opposite the north-western beacon of Sabonabon.

[14th September, 1911.]

FENCING ORDINANCE, 1904.

NOTICE is hereby given that it is the intention of farmers and landowners in the native district of Lomagundi to petition His Honour the Administrator to bring into force and to apply the provisions of Part I. of the Fencing Ordinance of 1904 to the native district of Lomagundi.

FENCING ORDINANCE OF 1904.

AREAS WITHIN WHICH IN OPERATION.

THAT portion of the native district of Bubi, Matabeleland, within the following boundaries:—

From the S.W. beacon of Sevu (Vincent's) Farm on the Khami River, along the W. and N. boundaries of this farm, thence along the W. boundaries of Steven's and Rochester farms to the N.W. beacon of Rochester, thence along the N. boundary to its junction with the Umguzan Block, thence along the W. boundary of this block to the Umgusa River, thence up the latter till it strikes the N.W. boundary of "Galeta's Kraal," thence in a northerly direction along the N.W. border of this farm and the outspan, thence along the N.E. border of this outspan and Shiloh and the E. boundaries of Shiloh and Paddy's Valley, and the N.E. boundaries of Sailor's Hope to the farms Dingaan along the N. boundaries of Dingaan, Hambagahele, Gravesend Extension and the N.W. boundary of Induba to the Bembesi River, thence along this river to the S.W. beacon of Battlefield Block, thence along that portion of the S. and S.W. boundaries of the native district of Bubi to the S.W. beacon of Sevu Farm.

That portion of the native district of Goromonzi and Mazoe bounded

To the Northwards by a line running along the boundaries of the following farms, and leaving them to the south thereof: Nalire, Sigaro, Selby, Mount Hampden, Bendauch, Glenara, Eksbank, Ingleborough, Calgary, Welston, Borrowdale Estate, The Springs, The Grove, Umritsur, The Meadows.

To the East and South-Eastwards by a line running along the boundaries of the following farms leaving them to the west and north-west thereof: The Meadows Rudolphia, Thornvlei, Grasely, Guernsey, Gilnockie, Gardiner, Sebastopol, Ventersberg, Epworth, Hatfield Estate, Godavery, Idesleigh.

To the South and South-Westwards by a line running along the boundaries of the following farms, leaving them to the north and north-east thereof: Idesleigh Extension, Boutelle, Eyerston, Spreckly, Waterfall, Makabusi Outspan, Willowvale, Heaney, Whiteliff Rainham and Sunnyside.

To the Westwards by a line running along the boundaries of the following farms, leaving them to the east thereof: Sunnyside, Derry, Penrose and

Nalire, but excluding the following properties: all freehold properties with in the Salisbury town lands, the Ardbennie township, and the farms Avondale and Mount Pleasant.

That portion of the native district of Bulalima-Mangwe within the following boundaries:—

From the easternmost beacon of Farm Highfield along its eastern boundary, thence along the north-east boundaries of farms Holmwood and Wesleyan Mission Station to the point where the latter boundary intersects the Tegwani River, thence down the Tegwani River to the point where it intersects the Bechuanaland Protectorate border in a southerly and easterly direction to S.W. of the farm Dryden, thence along the southern and eastern boundaries of farm Dryden, to the northern beacon of farm Luscombe, thence along the southern and eastern boundaries of Plumtree Outspan to the point where the railway line enters the outspan, thence along the north side of the railway line to the easternmost beacon of farm Highfield.

No. 306 of 1911.]

[5th October, 1911.]

IMPORTATION OF PLANTS, Etc., REGULATIONS.

WHEREAS the insect pest known as San Jose or pernicious scale (*Aspidiotus perniciosus*, Comstock) has been discovered infesting nursery stock, fruit trees and other plants in the Transvaal Province of the Union of South Africa.

Now, therefore, under and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that, from and after this date and until further notice, the introduction into Southern Rhodesia of any plant or plants, not being fruit, seeds, bulbs, cut flowers, vegetables or vegetable transplants, grown in the Transvaal Province of the Union of South Africa is prohibited unless special permission in respect to each consignment be first obtained from the Director of Agriculture, Salisbury, Southern Rhodesia.

No. 308 of 1911.]

[7th October, 1911.]

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby—

1. Cancel and withdraw Section 19 of Government Notice No. 329 of 1910, and in lieu thereof substitute the following:—

"19. All cattle within the limits of the various commonages, townships and actively infected areas, or on common grazing ground, shall be dipped or sprayed at least once every three days, unless the Chief Inspector of Stock shall, for sufficient reason, authorise the extension of the time between such dipping or spraying, or the entire suspension of the same."

2. Further amend Section 16 of the aforesaid Government Notice by the addition of the following clause to the proviso published under Government Notice No. 200 of 1911:—

"(e) Cattle for *bona fide* farming and dairy purposes may be moved into and within such declared areas under the conditions of Sections 5 and 6 of the above-mentioned Government Notice, and under such other conditions as may be imposed by the Chief Inspector of Stock.

No. 310 of 1911.]

[5th October, 1911.]

ESTABLISHMENT OF A POUND AT SANDOWN FARM No. 8, BULALIMA-MANGWE DISTRICT.

UNDER and by virtue of the powers vested in me by Section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Bulawayo, the existing pound on the farm Leighwood, near Figtree, established by Government Notice No. 115 of 1909, has been abolished, and a pound has been established

on the farm Sandown No. 8, in the native district of Bulalima-Mangwe, and that the said pound shall be available for the public from the 1st October, 1911.

No. 341 of 1910.]

[22nd December, 1910.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel section 3 of Government Notice No. 295 of 1908, in so far as it relates to the area described in section 6 of schedule "A" being reserved for the quarantining of animals for certain diseases, and declare that the area be set aside for the segregation of cattle brought to Gwelo for sale.

No. 61 of 1909.]

[1st April, 1909.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the areas described in Government Notice No. 295 of 1908, as areas set apart for the depasturing and quarantining of animals for slaughter in the township of Umtali and at Penhalonga, and in lieu thereof substitute the following:—

UMTALI.—*Description of Area.*—A piece of fenced land situated on the old Darlington Farm section of Umtali commonage.

PENHALONGA.—*Description of Area.*—A piece of fenced land situated on plot No. 2, Imbeza Plots.

[15th August, 1911.

IMPORTATION OF STOCK FROM EUROPE.

IT is hereby notified for public information that, owing to an outbreak of Foot and Mouth Disease in Holland and Great Britain, the Union Government has published regulations prohibiting all importation of cattle, sheep and pigs from the Continent of Europe and Great Britain. Provision has, however, been made for the admission of animals already on board ship, subject to inspection and such conditions as the Minister for Agriculture may see fit to impose.

No. 285 of 1911.]

[7th September, 1911.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of Clause 11 of Government Notice No. 45 of 1909 to be in force in the native districts of Charter and Chilimanzi for a period of three months from date hereof.

No. 289 of 1911.]

[7th September, 1911.

APPOINTMENT.

IT is notified for public information that His Honour the Acting Administrator, has been pleased to approve of the appointment of Charles Robert Edmonds, Esquire, M.R.C.V.S., to act as Chief Veterinary Surgeon, *vice* Edmund Mullinger Jarvis, Esquire, F.R.C.V.S., resigned, during the temporary absence on leave of John Maclure Sinclair, Esquire, M.R.C.V.S., the appointment to take effect from the 1st September, 1911.

No. 271 of 1911.]

[17th August, 1911.

SYMPTOMATIC ANTHRAX (SPONSZEIKTE).

WHEREAS an outbreak of Symptomatic Anthrax (Sponszeikte) has occurred on the farm "Innesfallen," in the district of Insiza, I, under and by virtue of the power conferred on me by section 2 of the "Animals Diseases Amending Ordinance, 1911," do hereby declare the said farm to be actively infected for the purpose of the said Ordinance.

Department of Posts and Telegraphs,

Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.

ADVERTISEMENTS.

RUBBER TREES

Ceará: Is. to Is. 6d.; seeds 10s. per 1000, 7s. per lb., postage extra. Cash with order.

C. F. M. SWYNNERTON, Melsetter.

MESSRS. MACLAURIN BROS.

(Breeders of Pedigree Friesland Cattle.)

Orders are being booked for young pure-bred Friesland Bulls bred by pedigree sire and dam.

These Bulls are bred and reared on the Farm Pomona, near Salisbury, a Redwater area, and thus farmers may obtain highly bred animals without the usual risks attending importation and immunising.

Particulars of pedigree and prices will be obtained on application to Messrs. MacLaurin Bros., Salisbury.

FOR SALE.

Shorthorn Bulls, Africander Bulls, Half-bred Shorthorn Bulls; all classes of stock for farm or trek. As no milking is carried on the young stock are particularly well grown, being hardy, well bred and acclimatised. One pure bred Ayreshire Bull, suitable for dairy farmers. Two pure bred Merino Rams. The Rhodesia Ranching Coy., Darwendale Estate, Umvukwe.

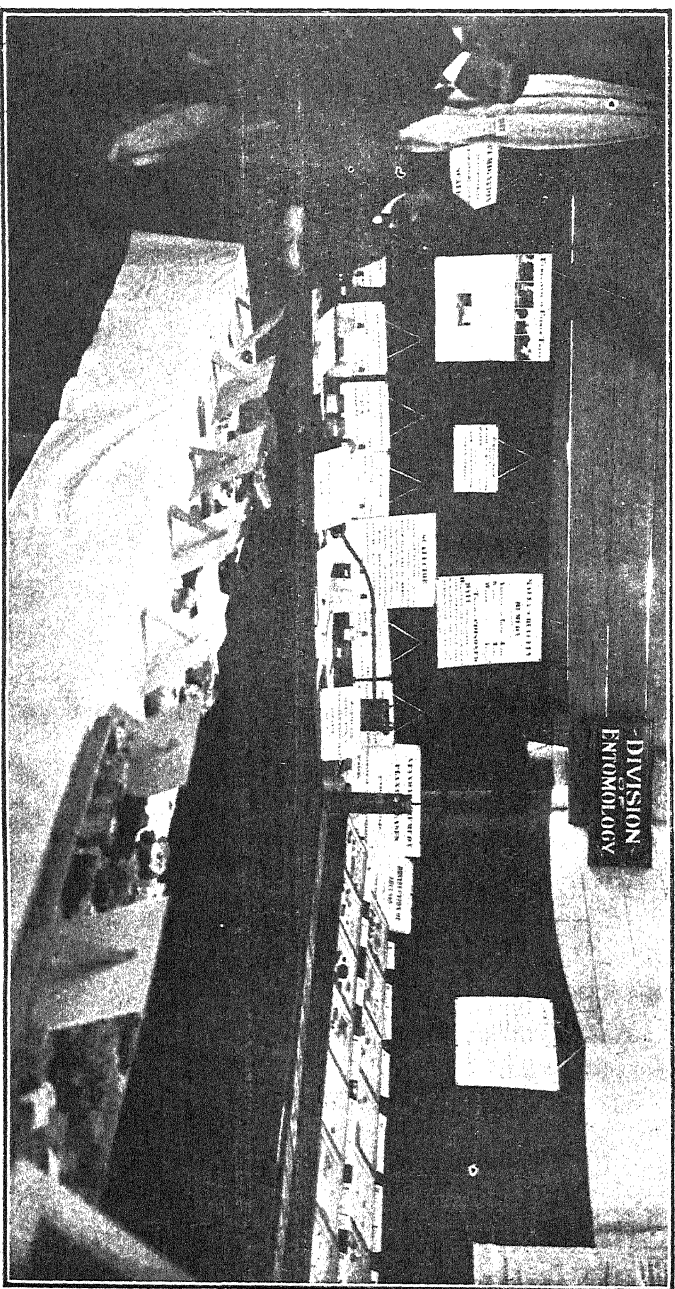
SEED MAIZE.

Boone County and Salisbury White, Three First and one Second Prize at Umtali Show. Guaranteed from selected cobs. 40s. f.o.r. Inyazura.

Apply WALTER H. SWAIN.

FOR SALE

Half-bred Bull Calves, by Hereford bulls ex-Colonial cows of Afrikander type; bred in the Bulawayo district on Redwater veld.—Apply: C. S. Jobling, Devonby, Bulawayo.



Departmental Exhibit at the Agricultural Shows. Division of Entomology.



THE RHODESIA
AGRICULTURAL JOURNAL.

*Edited by the Director of Agriculture
assisted by the Staff of the Agricultural Department.*

PUBLISHED BI-MONTHLY

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Editorial.

DIPPING AND TICK DESTROYING AGENTS.—The above heading forms the title of a most interesting and valuable report by Lieutenant-Colonel Watkins-Pitchford, which appeared in the *Union Agricultural Journal*, July, 1911. By the courtesy of the Government of the Union of South Africa we are enabled to reproduce this article in the RHODESIA AGRICULTURAL JOURNAL for the benefit of Rhodesian farmers

It is unnecessary to comment in any way upon the article, or the experiments that have been carried out to prove certain interesting points in connection with the subject, because the steps taken, and the results obtained, are fully set forth for all to read and judge for themselves. Mention may be made however, that amongst others the following points are dealt with:—"Prescriptions for the preparation of dip in various strengths, to suit the individual stockowner, recommendations as to the frequency of dipping according to circumstances, the length of time required to clean veld of ticks infected

with African Coast Fever, the mechanical transportation of ticks by foot travellers, hay, hides and sheep, the effect of frequent dipping on milk secretion, and on working, and other cattle, etc."

Every Rhodesian Stockowner can be confidently recommended to go very carefully into this article, and not leave one single point of it until he has thoroughly grasped its full meaning, and practical importance. Then he should ask himself the question: "Is it a sound business proposition to erect a dipping tank?" In answering the question, probably among the first things considered will be:—

Cost of Erecting a Tank.—The average cost to a farmer of erecting a cement concrete tank, built according to the Government tank, excluding any charge for his own time in superintendence is between £100 and £150. For such a tank by first obtaining approval from the Government he can receive a grant in aid of £50. This amount should be deducted from his actual expenditure, and the balance should be written off by him in annual sums, extending over a period of years.

Cost of Dipping Material.—If proprietary dips are employed the cost will be of course the price of the particular dip used, if 3-day or Laboratory Dip, the following are the approximate prices of the materials in Salisbury and Bulawayo: Arsenite of Soda, guaranteed 80% in 8½ lbs tins, 7d. per lb, soft soap, 6d. per lb, paraffin 2/- per gallon. In addition to this there is the labour entailed, but once cattle are used to dipping this is not great.

On the other side of the question, the stockowner will consider the number, and the value of his cattle, and what they represent to him. He will also consider what risk he runs of getting African Coast Fever amongst his stock, and here it is necessary to point out that although great advances have been made in the knowledge of the disease there are still some points of immense practical importance, that have not been cleared up. He will view a tank on his farm as an insurance against the worst ravages of African Coast Fever, and other tick conveyed diseases, the list of which is frequently being added to. The increased growth, good health, and improved condition of his stock, as a result of

being kept free from ticks, is a consideration of primary importance, and last but not least, is the security replacing the "ruin staring me in the face" feeling a man without a tank has, when African Coast Fever breaks out in his locality.

JOHANNESBURG MUNICIPAL ABATTOIRS.—The Director of the Johannesburg Abattoirs and Live Stock Market has kindly forwarded to this Department a copy of his Annual Report for the year 1911. This report makes extremely interesting reading as indicating the comparatively large markets which already exist in South Africa for slaughter stock of all descriptions. It is also interesting to note that the abattoirs are worked entirely by white labour and that the experiment is meeting with complete success. On an average upwards of two thousand head of mixed stock—cattle, sheep, and pigs are slaughtered daily in these abattoirs for the provisioning of Johannesburg and its surroundings. During the year under review, *ie.*, from the 24th October, 1910, to the 30th June, 1911, 256,839 head of stock passed through the slaughter halls being comprised as follows :—

Oxen	33,782	Calves	1,800
Sheep	202,140	Pigs	19,117

or a monthly average of 4,223 oxen, 25,268 sheep, 2,390 pigs and 225 calves.

Every carcase passing through the abattoirs is carefully examined by qualified meat inspectors, and it is stated that measles in pigs is very prevalent and all pig carcasses are examined with special care. In order to locate the disease if present, the following parts are closely inspected—tongue and heart, muscles of neck, breast, intercostals (between the ribs), midriff and psoas (loins). Cuts are also made in the muscles of both shoulders and psoas.

With the exception of condemned meat, which is only recently being profitably utilised, there is practically no wastage in connection with the abattoirs, the kafir eating-houses of the Rand affording an excellent market for "plucks," heads, feet, etc. A by-product plant is now in working order and is giving satisfactory results, while

needless to say a large demand exists in South Africa for such by-products as tallow and fertilisers.

An inspection of the Johannesburg Abattoirs is a liberal education in itself and permits of realising the vast importance which the meat industry and a meat export trade will mean to South Africa.

THE UNION DRYLAND FARMING CONGRESS. — This Congress met in Pretoria, on October the 18th, and occupied three days, the third day being devoted to an excursion to the Dryland Experiment Station at Lichtenburg. The Congress which was largely attended by farmers from all parts of South Africa, was opened by the Premier and Minister of Agriculture General Botha who in the course of his address dealt with many of the more important problems confronting South African farmers. Referring to the shortage of native labour in the Provinces of the Union General Botha said that to a great extent the remedy lay with the farmers themselves and further expressed the view that white emigration and closer settlement would prove the final solution of the problem.

Several interesting papers were read during the course of the Congress, that standing in Sir Thomas Price's name and dealing with the maize export question being of paramount importance. In the course of his remarks Sir Thomas pointed out that owing to the enormous production "Maize was King" in the United States of America, and he opined that by scientific working of the so-called drylands of South Africa it would also become "King" here. Mr. Du Toit, Superintendent of the Dryland Experiment Station, Lichtenburg, contributed a paper entitled "Lessons from Lichtenburg" and which in point of fact summed up the results achieved on the station during the past three seasons. Plant lice have proved one of the most serious handicaps to the success of winter wheat crops and it appeared to be only when the soil was naturally retentive of moisture that the plants had been able to grow away from this pest. The system which is being followed on the Lichtenburg Experimental Station aims at retaining as much moisture in the soil as possible by means of deep ploughing and frequent cultivation during the rainy season. The seed

is not sown until about the middle of the winter months and assisted by the early spring rains the crop is expected to ripen during November and December. In the Provinces of the Union and owing to severe winter frosts this may be necessary but given suitable soil the Rhodesian farmer is more advantageously placed since by earlier sowing and without excessive cold the dryland winter wheat crops can be harvested before the commencement of the rainy season.

Southern Rhodesia was represented at the Congress by Father Goetz, of Bulawayo, and by Mr. Godfrey Mundy, Government Agriculturist and Botanist, both of whom contributed papers.

EXPORT OF LINSEED.—Attention has been drawn to a misprint occurring on page 803 of the August issue of this Journal, Vol. VIII. No. 6, under the heading Linseed. In line twenty-eight it is stated that "the gross export charges on linseed exported in five ton lots from Salisbury to Dundee or Aberdeen would thus amount to £3 7s. 3½d. per ton." This should read *in fifteen ton lots*—the railage from Salisbury to Beira in such quantities amounting to 12½d per ton and the shipping rate to 55 - per ton.

REPORT OF THE SPECIAL MAIZE SHOW AND CONGRESS, 1910.—Attention is directed to the reference to this report under the heading "Reviews," in the current issue of the AGRICULTURAL JOURNAL. Through the courtesy of the Union Department of Agriculture a supply of these bulletins has been obtained and will be issued free of charge to any readers of the JOURNAL on application being made to the Editor. The report contains articles of a highly instructive nature to maize growers, and we commend it to the notice of all Rhodesian farmers.

RHODESIAN CITRUS FRUIT.—The *Rhodesia Herald* of the 9th October, draws attention to a press notice of the *Standard* regarding the exhibit of Rhodesian Citrus Fruit grown by Mr. R. McIlwaine, Salisbury, and recently on exhibition at the B.S.A. Co.'s offices in the Strand. The *Standard* looks forward to the day when Great Britain will be supplied with

lemons, oranges, grape-fruit, tangerines, and other members of the citrus family grown for the home market entirely within the British Empire. Practically all the 6,000,000 cases of oranges handled during the year at Covent Garden come from the groves of the Mediterranean countries, for instance, and the influx is greatest between December and April. Just now, however, oranges and other citrus fruits are having their comparatively slack season. The advantage to the home market in having cheap citrus fruits of good quality as plentiful from August to December as they are now from December to April, will be at once manifest. It is this advantage which should put the Rhodesian industry firmly on its feet.

DESTRUCTION OF SMALL BIRDS.—With the increased sowing of winter cereal crops, both under irrigation, and on damp soil, the injury done by small birds is becoming of some importance. Several correspondents have asked advice for coping with this difficulty, and if any readers of this Journal have found effective means of scaring or destroying these little enemies we shall be glad to hear from them through our correspondence columns. During the summer months, the small birds frequent the Kafir gardens, and cause considerable damage to the native crops of kafir corn and rapoko. In the dry season however, when there are neither grass seeds nor native grains, they seek for pastures new, and bid fair to become a serious nuisance to the grower of winter cereals.

A MARKET FOR COTTON IN SOUTH AFRICA.—During the past few years the cotton industry in South Africa has been adversely affected by the lack of local markets, and by the difficulty experienced in ginning the crop. Farmers in Rhodesia who desire to experiment with cotton, will doubtless be glad to learn that the firm of Messrs. S. A. Nathanson Commandite, P. O. Box 2611, Durban, are prepared to purchase cotton in almost any form. This firm undertakes to accept cotton of any variety, and in any quantity for consignment to the British Cotton Growing Association, Manchester, or to any other part of the world to which it is desired to ship. They also store, gin and press cotton by instructions of the grower and are prepared to make cash advances against

consignments. Messrs. Nathanson Commandite also state that they are prepared to buy outright for cash, either ginned or unginned cotton at the highest market prices. In the past, the farmer experimenting with cotton, has been handicapped by the difficulty of realising his crop, should it prove successful, and the establishment of a ginning and buying factory at Durban should do much to relieve the situation.

It may be mentioned that the railage for cotton from any part of Southern or North-Western Rhodesia to the Port of Beira is one-half-penny per pound.

DIRECTOR OF AGRICULTURE.—Dr. Nobbs, the Director of Agriculture, resumed his duties in Salisbury on November 29th, after attending the South African Agricultural Union Congress and the Irrigation Congress, both held at Bloemfontein, November 13th to 20th. During the latter part of his absence Dr. Nobbs has devoted much attention to the working of the forms of Land Bank and the Agricultural Land Loan Fund in operation in the South African Union, in order to ascertain the suitability of these to Rhodesian conditions, as compared with the Raffaisen system of co-operative Credit Associations.

The experience of the Union Government in these methods of placing capital at the disposal of South African farmers will be of great value to Rhodesia when introducing any similar system here.

We are glad to be able to state that the Director of Agriculture has effected a complete recovery from the indisposition which necessitated his prolonged absence from Rhodesia.

THE CHIEF VETERINARY SURGEON.—Mr. J. M. Sinclair, M.R.C.V.S., Chief Veterinary Surgeon, returned to Salisbury on November 17th and has resumed the duties of his office. For the present Mr. C. R. Edwards, M.R.C.V.S., is remaining at the head office.

POISONING BY ARSENICAL DIPS.—As cases of arsenical poisoning frequently occur, as the result of dipping, or of cattle having access to a solution of arsenic at the dipping

tanks, stockowners are advised to keep a few doses of the following antidote at their tanks :—

No. 1 Solution :

Liquor Ferri Perchloride, 3 ounces.

No. 2 Solution :—

One ounce of Carbonate of Soda in 12 ozs. of water.

Mix the two solutions, shake well, and administer immediately. A good dose of Epsom Salts should be given two to three hours afterwards.

Farmers are recommended to obtain the above solutions, prepared ready for use, from any chemist.

Dipping and Tick-Destroying Agents.

By Lieutenant-Colonel H. WATKINS-PITCHFORD,
Government Bacteriologist, Natal.

(Reprinted from the "Agricultural Journal" of the Union of South Africa, by kind permission of the Secretary for Agriculture.)

SYNOPSIS OF PREVIOUS REPORTS

THE following is the third of the reports prepared by Lieut.-Col. H. Watkins-Pitchford, Government Bacteriologist, Natal, on Dipping and Tick-Destroying Agents. The previous reports were published in the *Natal Agricultural Journal*; and in view of the fact that the majority of readers residing in the Cape Province, Transvaal, and Orange Free State, as well as in other parts of South Africa, have not had the opportunity of acquainting themselves with the full details of Mr. Pitchford's investigations in connection with dipping, and also to serve as an introduction to the present report, the following summary has been prepared of the results of investigations contained in Mr. Pitchford's former two reports.

First Report.—The object of this report was to show the efficacy of certain preparations intended for the dipping and spraying of cattle, the main object of the inquiry being to ascertain the frequency with which such dipping agents could be effectively applied for the destruction of ticks without risk or detriment to the animals concerned. The conclusions arrived at, therefore, were based not only upon the reliability of a dip as a tick-destroying agent for general use at short intervals, but chiefly upon its ability to permit re-application at a short interval without incurring damage to the animal system. The tick-destroying agents tested were as follows:—(1) Cooper's "Tixol"; (2) McDougall's Dip; (3) Quibell's Dip; (4) Cooper's Powder Dip; (5) Demuth's Dip; (6) Newton Chambers' "Izo-Izal"; (7) Thomas' Dip; (8) Holmes' Paste Dip; (9) "Taline Sheep Dip; (10) Electrolyzed Sea-Water; (11) Arsenite of Soda; (12) Erkenbrach's Paste Dip; (13) Alderson's Dip; (14) "Laboratory Dip."

The question of interval between dippings has been considered of much importance in view of the life history of the tick, especially of the brown tick (*Rhipicephalus appendiculatus*), so frequently responsible in one of its developmental stages for the transmission of East Coast fever; and the interval, therefore, between applications of the various solutions was made as short as possible in the investigations in order to prevent the tick surviving and thus leaving the body of an infected host and further propagating the disease. The problem of killing all parasites upon a beast every few days without involving the beast itself in danger by direct or cumulative effect of the repeated applications, proved a difficult question. Arsenic, which is the chief constituent of most of the dips, is a strong irritant to the skin, and in addition is capable of occasionally storing up or accumulating its poisonous properties and suddenly exerting such in the form of acute arsenical poisoning.

The desirability of frequent cleansing of animals at short intervals led the interval of four clear days (i.e., every fifth day) being determined upon as the shortest practical time to which such interval could be brought with due regard to the safety of the beast and the destruction of ticks. This minimum time of four clear days was, however, found to be too severe a test for the majority of the preparations under examination to conform to. This

difficulty led to the attempt to produce a dip suitable for use every five days without injuring the animals; this has now come to be known as the "Laboratory Dip." This dip has been well tested, and cattle have been put through the solution for sixty days at regular intervals of four clear days, the ticks being destroyed and the cattle maintaining their usual health. Furthermore, as far as Mr. Pitchford has been able to judge, cattle can be worked with safety directly after dipping in this "Laboratory Dip."

The only dip besides the "Laboratory Dip" which came before Mr. Pitchford's notice as being capable of frequent, safe and satisfactory application even to working oxen, was that used upon the Nel's Rust Estate (Natal). This dipping fluid is a modification of the Queensland dipping formula.

No attempt was made to compare the cost of the various preparations or to judge of the same from any preferential standpoint. All that was attempted was to ascertain the tick-killing properties of the preparation in question and the safety with which applications of the same could be made.

Second Report.—The second of Mr. Pitchford's reports dealt more with the manner in which the effects of a dip are exerted both upon the animal economy and upon the tick itself. More particularly, the observations recorded were designed to prove that the advantages of the adoption of a short-interval system of dipping are not merely the advantages to be expected from a more frequent immersion of the beast and the more frequent "mechanical" killing of the ticks upon its body by such immersion, but also the advantages of the striking secondary results which are found to attend the adoption of short-interval dipping. These secondary results appear to be of the nature of an habituation or tolerance of the tissues of the animal to the presence of arsenic. "The effects from these frequent dippings appear to accumulate within the animal's system, producing as they accumulate a corresponding degree of tolerance or habituation on the part of the animal, the deeper layers of whose skin gradually become temporarily charged so to speak with arsenic so as to render the beast poisonous to any ticks which may become attached in the intervals between the dippings." The excretion or throwing off from the system of the accumulated arsenic is, however, a rapid one, and it is only by the short-interval dipping or spraying that this loss can be compensated, if the animal is to be maintained in its maximum tick-killing condition; dipping at intervals of ten days or a fortnight means that the animal simply acts as the vehicle by which ticks are collected and conveyed to the dipping tank, there to be killed by submersion in an arsenical fluid. Gradual habituation is, however, necessary, but tolerance becomes rapidly established, and a few weeks only are necessary to accustom an animal to submersion in the "Laboratory Dip" every five days without any discomfort. It appears, however, to be some time after this point has been attained before the maximum degree of tick-killing capacity is reached, when the animal appears to be incapable of further accommodation, having reached a point, so to speak, of saturation. This accumulation of arsenic is observed to be not a mere mechanical deposition or passive soaking, but rather a vital and active process; and the observation is further borne out by the fact that any arsenic in excess of the maximum content is eliminated from the skin, the elimination taking place through absorption by the blood-vessels which are contained in its deeper layers, such excess of arsenic appearing shortly afterwards in the urine. When it is considered that it is into this deep layer of the skin that the tick thrusts its mouth parts and obtains its nourishment, the significance of being able to establish and maintain a supply of arsenic at such a point of attack is seen. It must be understood that it is not the circulating blood that is poisonous to the tick; destruction is effected by strictly local influences, and consequently the practical point which Mr. Pitchford emphasises is that all parts of an animal to which ticks can gain access must be subjected to the thorough application of the arsenical solution at short intervals. If this point is not observed, regions of the body will remain open to attack, and may prove the one small vulnerable point of attack, through which infection may become established. It has been observed that, of cattle put through dipping tanks, completely effectual immersions will not, as a rule, be found in much more than 80 per cent. of the animals. "These points," Mr. Pitchford remarks, "should be remembered

in routine dipping, otherwise areas of skin, such as the root of the tail or the inner ear (which are actual 'predilection sites' for the tick) will permit escape of the ticks there attached, and prevent the establishment of any habituation of the tissues at such spots. The smearing or hand dressing of these parts by oily preparations is a useful procedure, so far as it acts as a deterrent to tick approach, but if the protection of the animal is to be made as complete as possible such measures should not be made to supersede the application of the dipping fluid itself to the parts in question. If this thorough application of an arsenical solution to all parts is ensured, either by spraying or effectual dipping (or a combination of both processes easy of application), it will be found that the need for special oily dressings, etc., will be, in a great measure, done away with."

PART III.

PREVIOUS reports on the above subject have been designed to urge the adoption of the principle of a system of dipping at a shorter interval than usually practised, and also to pass in review the various existing proprietary dipping mixtures with a view to ascertaining their suitability for frequent application.

Our knowledge of the disease East Coast fever and of the life history of the brown tick—the chief transmitter of the disease—shows clearly that if we are to make sure of destroying the tick—and with it its infectious germ—we must attack it during the brief space that it spends engorging itself upon the blood of its host, the ox, and if we fail to ensure its destruction during this brief interval it will, by its survival, involve us in the risk of the perpetuation and extension of the disease. If, therefore, we are to make sure that no tick is to survive which once gains access to its host, our destructive attacks must be so timed as to leave no interval during which a tick may engorge itself and—potent for future mischief—leave the body of its host.

When we learn that a brown tick may complete one of its periods of attachment to its host in so short a period as three days, or even less, we shall see that our attacks (if we are to cut off all possibilities of escape) must be at correspondingly short intervals.

Fortunately, it happens that this minimum period of attachment is rarely found to obtain the time of the stay of the immature forms of the brown tick (the larvae and nymphs) being generally several days longer than above, a tenure which brings them within the destructive effects of the recently devised system of short-interval dipping. The repressive influence of the short-interval or "five-day dipping" upon

farms where disease has appeared has been amply demonstrated in the past, such instances being in strong contrast to cases where reliance has been placed upon the usual system of dipping at intervals of ten days or a fortnight.

Even where the short-interval system has been practised, cases of infection sometimes continue to occur from time to time under conditions and in places where no question exists of reinfection or reintroduction of the disease from outside. Such instances prove the possibility of the escape from an infected beast during the intervals between dippings of a certain number of ticks, and these ticks have served to keep alive and re-establish the infection after a lapse of many weeks or even months. Such outbreaks or reappearances of the disease are rare where the system of frequent dipping has become thoroughly established, for in such a case the possibility of the survival of the tick is decreased by reason of the "residual" or continued destructive effect exerted by cattle which have been frequently dipped, an effect which, while not always proving immediately fatal, is still frequently able to prevent the moulting of the tick and the arrest of its infectivity. This point, which was dealt with fully in Part II of this Report, will again be reverted to below.

The possibility of the disease being thus able in certain cases, in spite of the short-interval dipping, to reappear in a herd from which it seemed to have been eradicated, and the public inconvenience and private disappointment caused by such reappearance, led to the undertaking of the present work, in the hope that some system might be devised which would not only abolish this risk of recrudescence or reappearance of the disease, but would furnish a system by which its progress through a district or farm could be successfully opposed, or its ravages at least reduced to a minimum.

The main step in the solving of this problem was obviously the adjustment, if possible, of the principle of dipping to the life history of the tick, so that practically no chance should exist of any tick leaving its host, however short its stay, in a live (or uninjured) condition: but in order to adjust this point with exactitude it first became necessary to observe (by trial on a practical and ample scale) exactly when the danger of

such escape commenced, a point of time which, of course, coincided with the shortest length of time spent by the tick on the body of its host. Reference to Schedule I will show how this point was determined, and the reason for deciding that a period of seventy-two hours (or three days) was the longest interval which an animal could be allowed with safety to remain in undisturbed possession of its ticks.

The prospect, however, did not seem promising of being able, not only to adopt a 72-hour period of dipping with safety, but also under such a system to maintain indefinitely from month to month without loss of condition the animal subjected to the process. The reader who is sufficiently interested as to the detailed steps by which this point was arranged may refer to the schedules. Here he will see that the successful adjustment of the composition of the dipping fluid was not arrived at without some trouble in the endeavour to ensure (a) *Safety in use* (Schedule II), and (b) *Destructive effect on the tick* (Schedules IV and V).

These two cardinal points of safety and efficiency depended mainly, but not entirely, upon the adjustment of the arsenical content of the dipping fluid. Previous experiments had shown (see Part I of this Report) the method by which that essential ingredient, the arsenic, in a dipping fluid could be so adjusted as to give the maximum tick-killing effect with the minimum inconvenience to the beast itself, and this efficient arsenical percentage was shown to vary with and depend upon the intervals elapsing between dippings, a very high percentage of arsenic being tolerated where the dippings were separated by a period of some weeks. Where, however, it was found necessary to decrease the interval, i.e., increase the number of dippings in order to meet the problem of the destruction of tick life in all its phases, it became also necessary to greatly reduce the percentage of arsenic in order to avoid damage to the beast. Fortunately it was found that such reduction could be made without materially interfering with the poisonous effect upon the tick itself. In this way the composition of the old forms of dip which often contained as much as 5 lb. of arsenite of soda to 100 gallons (for monthly use) was reduced, in the "Laboratory dip," to 2 lb. per 100 gallons, a fluid which was found capable of application every five days.

This result seemed to comprise the shortest interval at which immersion in an arsenical fluid could be safely and effectively undertaken, and the wide adoption of this so-called "Short-interval dipping," as stated above, fully justified itself both by the restraint of tick life following its adoption and the undoubted check which it has exerted upon the spread of the disease East Coast fever.

As a regular procedure in the clearing up of a farm from its ticks, and in the absence of East Coast fever it was recognized at the time that so short an interval as five days would add materially to the routine trouble of farm life and make a considerable call upon the time, if not the purse, of the stockowner. Where, however, the possibility of the advance of East Coast fever had to be encountered, it was thought that no interval would be likely to be deemed too short, or trouble too great, if it increased the chance of ultimate escape. An extra inducement was also held out to the progressive farmer to adopt the short-interval system by showing that in so doing he would gradually render the poisonous effect of his more frequent dippings continuous from one immersion to another by reason of the accumulated or "residual" effect to be secured by such frequent immersion, thereby greatly facilitating the rapid clearing up of the farm besides this increased prospect of holding in check the infection should it become introduced. Such considerations taken together would, it was thought, fully warrant the adoption of the short-interval system, which, though somewhat irksome in its routine application, held out thus the prospect of a double ultimate advantage.

The fact is mentioned above that modified outbreaks continue in some cases to occur on farms where this process has been in use, showing the occasional escape of some forms of tick life from their infected host in spite both of short-interval dipping and its accumulated effect.

Our knowledge of the brown tick and its agency in the spread of the disease shows us that in such recurring outbreaks only the larval and nymphal forms of the insect could (after their escape from a sick beast and after moulting) be concerned in the production of future infection.

It is therefore obviously against the larva and nymph that our offensive measures must be directed in the endeavour to

prevent their future development into forms in which they may become capable of spreading the infection.

As has been shown in Schedule I, the period of stay of these possibly dangerous immature forms upon a beast has been found to be as short as three days, a point which has been demonstrated by previous observers. The above-mentioned schedule shows, however, the possibility of larvae and nymphs maturing and leaving their host even before the expiration of this period of seventy-two hours, seventy hours, sixty-eight hours, or even less, sufficing in some cases to permit of escape and the possibility, if infected, of transference of the disease.

Even the shortened interval of a three-day dipping system, therefore, would appear to be inadequate to guard against all the possibilities of spread of the disease, and it would seem that even such readjusted dipping measures must fail by a few hours in ensuring certainty of result.

Fortunately, however, we are able to cut off all chance of escape by preventing the attachment of the immature tick for its full period of seventy-two hours or even sixty-eight hours. Reference to Schedule VI will show that, while the adult and hungry tick will attach itself readily to the newly-dipped beast, both the larval and nymphal forms are deterred from biting for a period of at least some hours, an effect probably due to the paraffin present in the composition of the dip. The exact period of this revulsion or deterrent effect was not determined with exactness, but it is of such a length as to amply cover the three or four hours of the seventy-two hours' interval which the dipping leaves unguarded. Proof of this fact will be found in the experiment described later in paddocks D and E, where the infection of these paddocks must have been inevitable had the innumerable nymphs and larvae present been able, in even a single instance, to use the whole interval of seventy-two hours for the purpose of their development, and so effect their escape, as in the case of the early-maturing ticks in Schedule VI.

The destruction by the system of five-day dipping of all *adult* ticks should be certain, owing to the length of time they remain attached to their host, a period which will ensure a second immersion in cases where attachment persists. Where, however, the period of attachment, as in the case of the larva

and nymph, may be so short as to permit engorgement and escape between one five-day dipping and another, the problem is obviously only to be met as suggested above by the adjustment of the dipping process to an interval which will render such escape impossible.

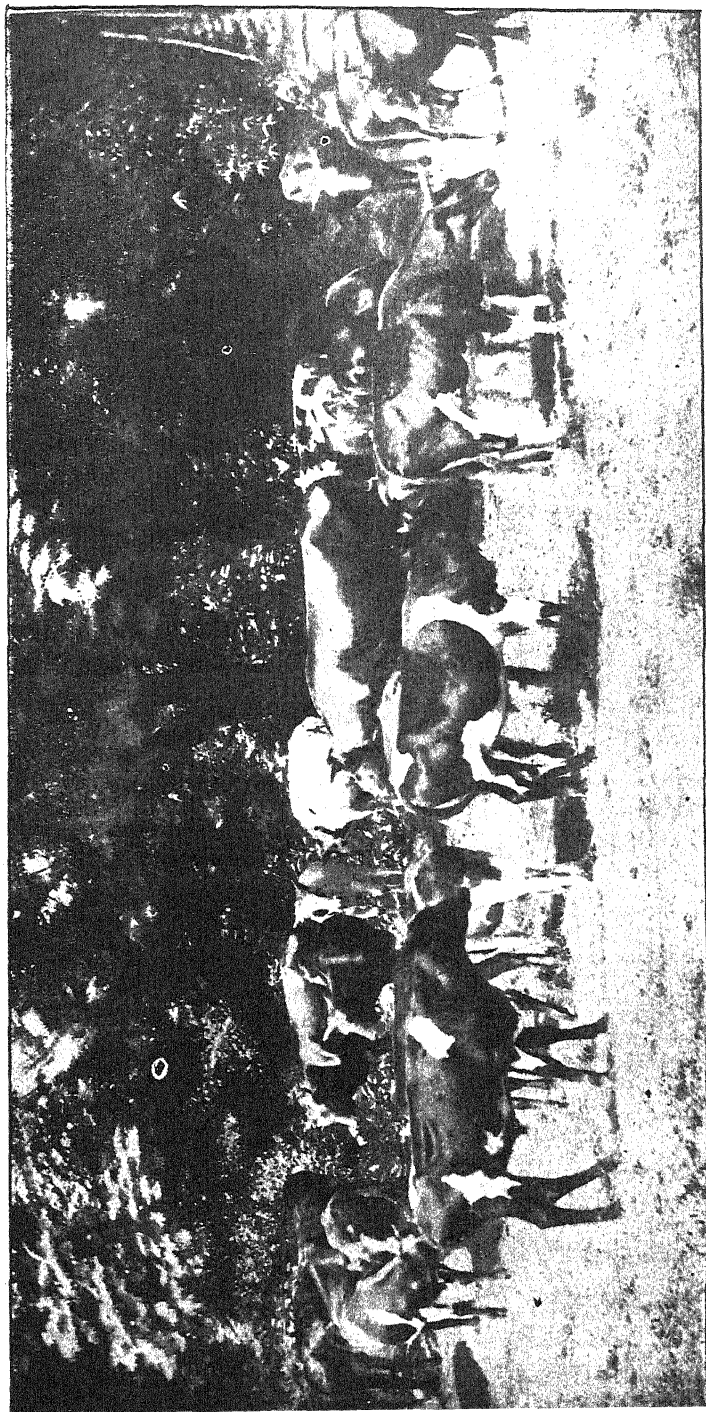
In view of the fact that the percentage of arsenic requisite to produce a destructive effect upon the tick had already been adjusted with some nicety it did not seem at first hopeful that this percentage could be very materially reduced (so as to permit of a still shorter interval being adopted) without affecting the efficiency or tick-killing power of the dip.

Fortunately, however, it happens that the larvae and the nymphs—the forms of tick life which we are particularly interested in destroying—will succumb when exposed to an arsenical solution considerably weaker than that necessary to ensure the death of the adult tick, a fact which seemed to render it possible, without detriment to the host, to reduce the interval between dipping so as to ensure the destruction of all larvae and nymphs, however short their stay. If this could be effected, the completeness of the destruction by one dipping of all the adult forms attached to the host might for the following reasons be viewed with comparative unconcern.

The adult female will, before becoming completely engorged, remain attached a considerable length of time and so be subjected to two or even three dippings before being ready to leave its host. How rarely after one dipping such female forms remain on their host uninjured and go on to full distension, may be judged from the fact that out of over 10,000 adult ticks actually counted throughout these observations on cattle being subjected to the new process only 69 partially distended females have been found.

Careful detachment of these distended ticks, and observation under favourable conditions, shows that, in the majority of cases, the dipping arrests the process of egg-laying, while of those eggs which are laid only a small percentage are capable of subsequently hatching out.

Where two immersions in the dip had been experienced by the distended tick, none of the eggs hatched, while only about 2 per cent. of such ticks were able to lay at all, and this to an imperfect extent.



Group of Frequently Dipped Cattle.

These experimental cattle (about 30 in number) have been regularly dipped for more than six months every 72 hours. The above photograph serves to show that, in spite of 68 such dippings, the condition of the herd has been maintained.

As, however, the laying and hatching of the eggs of the brown tick is without significance—in so far as the transmission of East Coast fever is concerned—the escape of an occasional female form from the effect of the dip is a point of no interest, except perhaps to the farmer who is seriously undertaking the eradication of all forms of tick life from his farm (and in such a case reference to Schedule III will show the small degree of importance to be attached to such escape).

The paddock referred to in this Schedule III (to which future reference will be made) furnishes a practical confirmation of the above assertion, for in this experiment had any appreciable and regular escape of distended ticks taken place from the herd grazing this paddock, no such striking diminution of the tick life on this ground could have been looked for or experienced. There remains then the consideration of the importance of the other adults after attachment to their host, viz., adult males and adult but unengorged females.

To these forms not even the slight significance can be attached which we accord to the distended female. It is, of course, true that such ticks may produce the disease if they have passed their nymphal stage upon a sick beast. But—as previous observers have shown—with such attachment their power for mischief ceases, nor are they able, even should they resist the effect of the dip, to keep alive further infection of the veld, a point of importance in the repression of the disease.

The actual lethal effect of the newly-arranged dip upon these mature forms is shown in Schedule IV. It will be seen that an average of 70 per cent. are killed by the one immersion in the interval of seventy-two hours before the repetition of the dip, while the remaining 30 per cent. succumb before the next dipping is due, within a period altogether of six days.

A much more marked destructive effect can be obtained by the repetition of the dipping process at intervals of forty-eight hours (see Schedule V)—a perfectly practicable procedure with the dip-fluid which is noticed below—but there is no valid reason for hastening the killing of these adult forms in so far as East Coast fever is concerned.

While for the above reasons it will be seen that we need not arrange our dipping fluid so as to kill rapidly all adult

ticks (for as we have shown not only are they negligible but their destruction is ultimately assured), it will be of the utmost moment for us to catch the elusive nymph and larva which, by escape, may maintain alive the infection of the veld. This result, fortunately, we are able to accomplish by lowering the strength of our dip (without lowering its essential efficiency) so as to permit of as frequent a dipping as will ensure the immersion of every tick—large or small—once attaching itself to a beast.

In the "three-day" dip the arsenical strength has been lowered until only one pound of arsenite of soda (of a standard strength of 80 per cent. arsenic trioxide) is used in the preparation of 100 gallons of fluid (a reduction in the arsenical content as compared with the previous Laboratory dip* of 53.5 per cent.).

This fluid—weak though it is in its essential constituent—is capable of fully meeting the two cardinal requirements mentioned above, viz., efficiency in tick destruction and safety in repeated use.

In the composition of this dip both the soft soap and the paraffin have been retained as necessary.

Endeavours have been made in certain quarters to do without these ingredients in the "Laboratory dip" and use a simple solution of arsenite of soda in the dipping tank. Part I of this report showed that the use of arsenite of soda alone was investigated and abandoned as being too caustic in its effect upon the skin for short-interval dipping. Reference to Schedules II and V of the present report will also give details as to the use of an arsenical dip at short intervals without the addition of soap and paraffin. It will be seen from the table that not only was it impracticable to use the arsenite solution alone (by reason of its irritating nature), but, further, that it failed to kill the ticks brought into contact with it as efficiently as the complete formula.

It is essential then for the purposes of the present short-interval dipping system that no alteration be made in the com-

* The new fluid contains only .03 per cent. of arsenic trioxide as against .17 per cent. in the original Laboratory Dip.

position of the dip if the two points insisted upon above, viz., safety and efficiency, are to be assured.

While it will be found that the formula given (the exact manner of compounding and mixing of which will be found in Schedule VII) will be efficient in its general results, there is one part of the body—the ear—which calls for special treatment. By using the old Laboratory formula the ears were effectively cleaned, provided care was taken to ensure the entrance of the fluid by complete submersion of the head. Where however the more diluted dip is used it is found that occasional nymphal ticks can survive the process if they have begun to swell or engorge before the dipping takes place. Only such ticks, however, as have attached themselves far down the meatus or passage of the ear appear thus to occasionally survive. The removal of the ear of a dead and tick-infested beast close to the skull will show in some cases numerous nymphs attached to the wall of the passage capable apparently of completing their engorgement in that position and escaping in due course to complete their life cycle as adults.

Probably the inaccessibility of such a region, together with the fact that the narrowing walls of the passage are coated with a waxy substance (cerumen), tends to prevent the penetration or efficient contact of the dipping fluid, and where this latter—as in the dip in question—is of low arsenical strength, ticks in such a situation may well survive the ordeal of one or even two immersions.

Although none of the engorged nymphs removed from this situation after dipping or spraying have proved able to moult, the fact that many survived for a considerable period points to this spot as a weak one in our defences. It was, therefore, determined to undertake the separate treatment of the ears, a procedure which, though increasing the routine trouble, seemed to render assurance doubly sure.

The chief difficulty encountered in this routine swabbing of the ears was the fact that the delicate lining membrane of the auditory canal would not tolerate the necessary frequent application of any preparation of an irritant nature. The usual coal-tar derivatives mixed with grease (a compound widely used for this purpose in the past) had to be abandoned in favour of something easily obtainable, as cheap, and less

irritating. This desired material was found in due course, and, after extended trial, has given excellent results, killing all forms of ticks with rapidity and certainty, and not producing any irritation of the lining membrane of the ear however frequently applied. The homely character of the prescription and its ready availability will not be found to detract from its usefulness. Details of preparation will be found in Schedule VIII.

It now remains to show the results given by the above preparations in the practical tests of prevention and suppression of East Coast fever, and also in the eradication of tick life from infested areas.

At the end of this report will be found a map or diagram showing the sub-division into paddocks of a portion of the town lands* of Maritzburg. (See Schedule IX.)

These paddocks—which comprise a considerable area—are of varying shape, determined by the purpose for which they were constructed, and to some extent also by the contour of the ground. The northern or top boundary is some 750 feet higher than the southern fence along the banks of the spruit. Several wooded kloofs run north and south and divide this area, while along the lower grounds a good deal of marshy ground exists. The vegetation along the southern part of the paddock marked A is very dense, while most of the paddocks have considerable stretches of old (last year's) grass.

It will thus be seen that the ground chosen presented features representative of an average farm as regards tick habitat, differences in elevation, etc.

In Schedule IX (map) it will be noticed that certain of these paddocks are surrounded by double lines of fence. This double fencing was undertaken chiefly to ensure the isolation of such paddocks from adjoining ones as well as to provide

* The accommodation at the laboratory for a work of this nature being quite inadequate, the Corporation of Pietermaritzburg was approached and, the requirements of the case being explained, permission was asked for the use of as much as was found necessary of the town lands contiguous to the laboratory for the purpose of carrying on this experimental work on an extended scale. It is with much pleasure that I am able to acknowledge the ready sanction which was accorded to the request, and it is due in no small measure to this helpful attitude on the part of the municipal authorities that the following observations were able to be undertaken and thus recorded.

means of access. In the paddocks B, D, E, T, H, and F, active infection existed, and it was part of the scheme of experimental work to demonstrate or disprove the possibility of the extension of the disease by what might be called natural means, i.e., the crawling of infected ticks from one enclosure to another. The distance between these double lines of fence was determined on after a preliminary experiment, undertaken to show the actual distance travelled by the most active form of tick life—the hungry adult. The results of this experiment will be seen in Schedule X, in which a diagrammatic representation of the distance and rate of travel is shown. The schedule shows that of 770 active hungry ticks the furthest migration noted was twenty yards, the great majority coming to an apparently permanent rest within half this distance from the liberation point.

In placing the distance at thirty yards therefore as the interval for the double fences it was thought a safe margin was allowed, the correctness of which opinion was borne out subsequently, as no case of the transmission of the infection from any one paddock to another has occurred across this space (a point which will be noticed below in speaking of the means of transference of the infection).

Provision for isolation by distance having been as far as possible made, the fences as shown in the map were erected, so plotting out the area into spaces approximately of the shape shown. Each of these paddocks designedly enclosed certain patches or strips of old grass, but the greater part of each of the enclosures comprised good growing grass which rendered artificial feeding unnecessary throughout, experiments lasting approximately from September, 1910, to the end of March, 1911.

A good number of ticks existed upon the ground thus enclosed, a number which can be approximately judged by the average daily number picked up by the herd when commencing to graze paddock A (see Schedule XII).

In paddocks D and E, however, it was the intention to ensure a degree of tick infestation as gross as possible, and for this purpose the hatching of tick eggs was arranged on a large scale so as to ensure the liberation of some millions of larvae

of the brown tick. Distended females were collected in numbers and placed in many large flat glass jars (about thirty-five in each vessel) and kept in the Laboratory buildings. The average number of eggs laid was about *6,000 per brown tick. When the eggs commenced to hatch the glasses containing them were uncovered and placed in the midst of patches of long grass under proper shelters to keep off direct sun and rain. A gross infestation of the veld was thus ensured, the ticks rapidly attaching themselves and going through their various stages on the cattle running in the paddocks so infested.

In this way the natural condition of a grossly infested veld was simulated as closely as possible, and the cattle in these paddocks (D and E) were maintained under conditions of infestation—without restraint by dipping—such as they would experience if grazing naturally on badly tick-infested veld.

The main intention of this experiment was—by the adoption of the three-day dipping—to prove the possibility of introducing beasts suffering from the disease East Coast fever into such paddocks (amongst healthy animals and amidst countless ticks) without incurring the risk of spreading the disease or contaminating the veld.

All the elements of a fierce outbreak would thus be assembled together and the introduction of a single infectious tick would probably prove the spark producing the conflagration.

Before, however, this critical experiment—which by failure would involve the loss of a number of cattle—was undertaken, preliminary experiments were decided upon. These “limited liability” experiments were undertaken with the object of determining whether a tick-infested sick beast is able to contaminate the ground upon which it stands if it is sprayed at intervals of seventy-two hours. Such preliminary experiments were carried out as follows:—Two beasts were infected with East Coast fever (by turning them into a small infected experimental paddock kept for the purpose of producing the

* These numbers were computed by weight—a sufficiently accurate method for the purpose in hand, the average weight of 100 Brown tick eggs is about 5 milligrammes, a single egg weighing .05 milligrammes, or approximately 1,000,000 eggs to 1 ounce. Larval ticks shortly after hatching were found to weigh .0026 grammes per 100 approximately, a weight of only about half a grain to 1,000 ticks.

disease when necessary). As soon as these animals reacted they were removed from this paddock, sprayed with the three-day dip and tied up for several days (until free from ticks and until the specific organisms appeared in their blood and gland juice). They were then taken to certain spots in paddock H (see map, spots marked with an * distant at least 50 yards from each other) and were there picketted and at once infested with numbers of brown ticks in all stages of development. The area of ground therefore which would become contaminated by falling ticks would be at first limited to the circle described by an animal in walking round its picket peg.

At noon upon the fourth day (seventy-two hours) after being placed on these spots the animals were removed to a little distance and again sprayed with the three-day dipping fluid. Here they were allowed to stand for an hour and were then removed to two fresh sites and again picketted, while the neighbourhood of each original spot of occupation was at once fenced in. After a further lapse of three days the procedure was repeated, the beasts being removed and sprayed and the spot upon which they had stood enclosed.

The disease usually proving fatal on the third spot thus occupied the carcass of the animal was skinned and removed, the hide being left where the animal died, a spot which was again fenced in.

The above experiment was then repeated on exactly the same lines, using two other infected animals to control the observation of the first, and reduce the risk of coincidence or insufficiency of data.

As a variation of the same experiment two further animals were taken and allowed to remain in the infection paddock until they showed the organism in their system and were heavily infested with ticks. They were then sprayed as usual but no time was allowed for the beast to become cleaned of its numerous ticks. In this condition, while grossly infested with all forms of tick, both mature and immature, they were pegged out on plots in paddock H with the above cases, and were treated in a similar manner to them, being sprayed and removed to fresh ground every three days as long as life lasted.

After the various enclosures (at distances of 50 yards from each other) upon which these animals had been confined and died, had remained closed up for a minimum period of one month, they were opened and a healthy beast was placed within each enclosure.

The object of the above preliminary experiment therefore was to secure an answer to the question:—

Can a sick and tick-infested beast convey the disease or contaminate the veld if sprayed every seventy-two hours with the three-day dip?

It is obvious that if any ticks had been able to escape unharmed after feeding on these sick beasts, the ground or plot upon which the latter were tied and its immediate neighbourhood would in due time become dangerous to a healthy beast subsequently confined upon the same plot.

1. Thus if no appearance of the disease took place on these plots first occupied by animals which were brought on to the ground sick but free from ticks (and were then infested and allowed to remain unsprayed for a period of seventy-two hours) the conclusion is justified that no infectious forms could have had time to engorge and leave their host before the removal of the beast to the next plot.

2. Further, if the second plot of ground occupied by an infested and sick beast remained uninfected when healthy beasts were subsequently confined upon it, the inference would be justified that the spraying process undertaken when the beast left the first plot at the end of a seventy-two hours' stay had sufficed to arrest the disease.

3. Similarly if no infection of the first or subsequent plots followed the presence of beasts placed there while not only sick *but harbouring all forms of ripe brown ticks*, it is obvious that the effect of the single spraying, given immediately before the occupation of the plots, sufficed to check the disease and prevent the development (though perhaps not the escape), not only of unfed ticks but of those already distended ticks on the point of leaving their host.*

* In the case of engorged nymphs, which have received one spraying with or dipping in the three-day dip, the results are (as with the distended adult) not always immediately fatal. In many cases the normal period for moulting is greatly exceeded, and though life persists, examination of the interior of the nymph fails to show any evidence of the development within of the adult insect. Such a tick would, of course—however long it retained its vitality—be quite incapable of any further infective action.

The outcome of the above experiment was, briefly, that no disease developed on any of the plots where the test or control animals remained several months.

The question, therefore, was conclusively answered as to whether a sick beast (infested with ticks and harbouring organisms in his blood, etc.) could convey the disease or contaminate the veld if sprayed every seventy-two hours with the three-day dip fluid.

The final and controlling test was then hazarded under conditions as critical as possible. Paddocks D and E had been prepared as described, *ut sup.*, and had been grazed for some months by a small troop of healthy cattle, ten in number (a number subsequently increased), which were intended for the purpose of another experiment (to be referred to below).

As previously described, excessive tick infestation existed, and had been promoted, and into these paddocks were drafted all the sick cattle as they became available from another series of experiments undertaken to show the general means of conveyance of the disease.

The only precaution taken at first was the spraying of the sick beast, or, if strong enough to travel and climb, its immersion in the dip-tank before it was placed in either of the paddocks in question (D and E). Later, when the importance of guarding against the survival of ticks in the deep ear passages was recognised, the ears of all sick animals were dressed with the mixture described in Schedule VIII.

This process of spraying was carried out every three days, the sick beast being brought just outside the paddock for the purpose and returned shortly after the spraying was concluded. This procedure was continued during the life of the animal, and its hide was finally left to be investigated by the healthy cattle in the paddock. In this way, extending over a period of three months, ten sick animals have been introduced into these paddocks and allowed to die there. The ticks of the paddock have readily attached themselves to the sick beasts during the seventy-two hour intervals between spraying, and, though ample time has elapsed, no single case of the disease has been produced, the healthy and heavily tick-infested cattle grazing with the sick beasts indiscriminately as long as the latter lived.

No sick beast was introduced into these paddocks until it showed positive microscopic evidences of suffering from the disease.

The dividing fence between the paddocks D and E erected for the purpose of another observation was maintained during the early part of the above experiment, as into the lower paddock E were introduced two sick beasts directly after spraying and while carrying ripe ticks in their coats. The stringency of this latter test and the possibility of its failure seemed to render it expedient to maintain the fence between the paddocks in order, in the event of failure, to prevent confusion in interpreting the exact causes and results, and to limit probable loss. Such fears, however, proving to be groundless, the double fence was removed and the paddocks were made one.

Situated on the fringe of the advancing disease, with multitudes of ticks upon the farm, the outlook of the stock-owner has hitherto been a black one.

He has been told that if he can eradicate the tick the disease will not appear, but the eradication of the tick has seemed to him an impracticable procedure, or only to be obtained after years of consistent dipping, while the disease is at hand and menaces him from day to day.

Now, however, his case will be more hopeful for—provided the disease has not yet reached him and his farm is fenced and he is willing to undertake the small amount of extra trouble consequent upon the adoption of the system below—there seems, in the writer's experience, no reason why the danger should not either be averted entirely or reduced to quite insignificant proportions, while at the same time the rapid clearing of the farm from all forms of tick life (a problem dealt with below) will more than compensate for the trouble involved in the carrying out of the system recommended.

In dealing with farms already infected, the difficulty is greatly increased, particularly where large areas, perhaps imperfectly fenced, have become contaminated by ticks falling from sick beasts. Where, however, the disease is known or supposed to be confined to paddocks of limited size the eradication of the disease under the new system of dipping is not so serious a problem as it has been considered in the past, pro-

vided an adequate number of sheep or horses are available for the purpose.

The following experiment was designed to show both the length of time and the effort necessary to ensure the clearing up of the infection on an enclosed area of limited extent. The paddock in question, marked G on the map, had, during the progress of the work described in Part II. of this Report, been used as an infection paddock, i.e., an enclosure into which cattle could be introduced in order to infect them or test their immunity. The paddock was not large, its length, roughly, being from 600 to 700 yards, and its breadth irregular. The grazing, however, was good, and tick life abundant. Although the infectious nature of this paddock was looked upon as beyond doubt, it was thought advisable before commencing the experiment to demonstrate this point to certainty; accordingly on 1st November, 1910, a beast (No. 114) was shut in this enclosure and allowed to roam. The taking of its temperature for the first time on 12th November disclosed the fact that it had already become infected with the disease to which it shortly after succumbed. On 17th November a troop of horses, donkeys, and mules (numbering nineteen altogether) was placed in the paddock. These animals were driven up every three days and passed through the dip, being brought along the left-hand path or drive shown in the map to avoid risk of contamination of the path by which beasts from uninfected paddocks approached the dip. Before dipping, the ticks in the mane and tail of each horse, etc., were carefully counted, a procedure which, though taking much time, was made in order to gauge the decrease of the ticks in the paddock from week to week.

During the first two periods of grazing (of three days each) the numbers of ticks brought to the dip were excessive, but on 25th November (the time of the third dipping) the average per animal had fallen to seventy-five, while a month later (28th December) it had been reduced to an average of four-and-a-half ticks per horse for the three days, from which point it fell slowly to an average of about one tick per animal per diem, around which point it remained for some time before further constant reduction was noted. These figures will serve to give an impression as to the rate at which we can effect decrease of tick life. (Observations on the more systematic clearing of larger areas are given below.)

The first effort to gauge the time at which this paddock lost its infectivity was made on 14th December, when the ticks were still numerous. On this date a beast, No. 104, was introduced and regular observations were made upon its temperature after the tenth day. No reaction occurring, even many days after the termination of the usual period of incubation, a further animal was introduced, and the temperature of this beast also remaining normal throughout a month's exposure, four beasts were introduced (19th January); and as these showed no signs of contracting the infection a further batch of five animals was turned in on 17th February and remained healthy. The quarantine of the paddock was then raised and the whole ground grazed over by the main herd without a case of the disease occurring.

The horses which had been used for the clearing up of the paddock were removed about the middle of December. Their condition had not suffered nor had any signs of skin irritation been produced by their frequent immersion.

In reviewing this instance it would appear that the period of occupation by the horses—from the 17th November till 14th December, the time the first beast was introduced, a period of less than a month—was sufficient to divest the paddock of its infection. Further observations tending to confirm the above finding were then undertaken. It has been above mentioned that certain paddocks, amongst which were B, J and F (*vide* Schedule IX.), were infected, i.e., contained beasts suffering from the disease. Such paddocks were used for various experiments (which will be referred to in their place), and at the conclusion of such experiments the grounds of these enclosures remained and were proved to be in a condition of active infection.

From such infective paddocks the danger was progressively removed by a method of systematic grazing and dipping—in the case of paddock B by sheep, and in J and F by the nineteen horses, etc., used in the clearing up of paddock G.

In certain observations on the modes of transmission of the disease referred to below it is shown that an effort was made to concentrate the infection against the outside fence of

paddocks D and E.* When beasts became very sick in either of the enclosures B, J, and F they were, towards the last, herded on the west side of their paddock in order to ensure the concentration of the infection as far as possible on the east side of D and E.

As these experiments became concluded an endeavour was made to clear up the infection from these paddocks by the herding of horses and sheep upon the areas known to be most highly infective. After several days of such concentration the troop was permitted to graze generally over the whole paddock, bringing to the dip every three days all the ticks attaching to themselves in that period.

In this manner it was found that quite a short period sufficed to eradicate the disease, e.g., in paddock J the horses were turned in on 8th February (an interval of six days); they were withdrawn and two control beasts were placed there, and have remained there since in a healthy condition. Paddock F was similarly treated, and after ten days' grazing was stocked in a similar manner with a like result. In paddock B a flock of 150 sheep† was employed. These were herded at first along the borders of paddock D, where the infection was likely to be grossest (proof of the existence of the infection on this ground will be found in the record of another experiment), and after ten days' grazing on and about the locality they were withdrawn (having been subjected to the process of dipping every week) and their place taken by four head of cattle, which, like the other test cattle, have remained uninfected.

The above facts, therefore, are brought forward to show that the hope of cleaning up localities where the infection is known to be restricted is not so remote as it has been generally thought. It is not suggested, however, that such measures as these described above can be adopted on unfenced farms over which the disease has swept unrestrained. Where, however, the invading disease has been fought rationally by segregation paddocks and the prompt isolation of sick animals, it is thought some method of systematic (not promiscuous) grazing, combined with short-interval dipping, will be found to hold

* A small * serves to show the relative spot in these paddocks where some of the infected animals actually died and where their hides were left.

† The use of the dip for sheep is dealt with later on.

out a good prospect of early and complete eradication, helping thereby the release of farms from quarantine restrictions which would otherwise have to remain imposed for lengthy periods.

In considering the deductions to be made from the above eradication experiments, the writer is aware that results achieved over such limited grazing areas as those available for the purposes of the experiment cannot be applied too closely to the problem of cleaning up paddocks or areas of great extent if the whole extent of such latter is presumably contaminated by the unrestrained wanderings of beasts in a state of infection and infestation with ticks.

It seems, however, permissible to hope that the results will be found capable of application on farms and premises where the conditions are favourable and the question of eradication one of the utmost moment.

Large infected areas will naturally require a larger number of unsusceptible animals to effect disinfection. In such cases the attempt is certain to be attended with success provided consistent efforts with adequate numbers are made, and the ground systematically grazed as illustrated in Schedule XI.

Reference has been made above to experiments having for their object the demonstration of the means by which ticks are conveyed and the disease East Coast fever is spread.

Various theories have been brought forward to account for the transmission of the disease from one locality to another. Men, animals, birds, vermin, hides, etc., have all been suggested as probable factors in the spread of the disease. Such conjectures, however, have not received, so far as the writer knows, the confirmation to be obtained only by observation under critical conditions.

It therefore seemed expedient to attempt the proof of some of the more prevalent opinions in order that, if proving fallacious, inconvenience and unnecessary restrictions might be avoided, while, if confirmed, increased care and more intelligent precautionary measures might be adopted.

Before, however, attempting the solution of the question of the spread of the disease by agents such as above, it seemed

desirable to inquire into some of the conditions governing the spread of the infection in its usual and more natural progress.

Reference to the map will show that paddock D is separated from the infectious paddock B by a single line of fence, while paddock E is surrounded on all its sides by a double fence. Around all sides of both these paddocks wire netting (3 ft. high and of $\frac{1}{2}$ inch mesh) was placed with the intention of arresting the passage into them of ground vermin (rats, rabbits, etc.) from the infectious enclosures B, J, and F. Early in November these paddocks D and E were stocked with ten head of cattle, and it has already been stated how the infestation of these enclosures with ticks was secured. Active infection had been introduced on 28th October into the contagious paddocks B, J, and F, and the disease concentrated as far as possible by herding sick animals close to the western fence of these paddocks. Several beasts actually died along this fence line during the early days of November, and their tick-infested hides were allowed to remain upon the spot.*

From the evidence afforded by entomological reports and by the results of the tests as to rate of engorgement, moulting, etc., given in Schedule I., infectious ticks could be expected to be present along this fence line towards the end of the month of November, and—provided the alley-way or division between the paddocks of 30 yards was insufficient—might be expected to make their presence obvious in paddock E some two or three weeks later, as no obstacle greater than a half-inch netting would oppose their entrance.

In paddock D, which was singly fenced, the eastern side of the fence line ran through a belt of last year's grass. A passage of six feet wide was cut in this grass along the outside of the fence, i.e., in paddock B, and three sick beasts were picketed in the long grass at such a distance that, although they could not encroach upon this passage way, they were within a few feet of it when at the full length of their short picket rope. These beasts were heavily infested with brown ticks in all stages, and they succumbed early in November.

The lower part of the paddock was then shut up to prevent possibility of artificial or inadvertent conveyance of ticks by men or animals from the long grass in B across the 6-foot path.

* These animals were, of course, not dipped or sprayed at any time.

way into D. In this case the distance barrier of 30 yards was absent, and the only defensive measure consisted of a passage 6 feet wide between the long grass in one paddock and that in the other.

The result of the above experiment is that no extension of the disease has occurred in either of the paddocks in spite of the fact that the grass on the outside of the fence was in a condition of virulent infection, a fact which later observations, *q.v.*, proved

The preliminary experiments designed to lead up to the above critical tests should be borne in mind when attempting to review the significance of the final result. Schedule X shows the maximum distance likely to be travelled by the average hungry adult tick, and it is a fair inference that the immunity of paddock E was due to the establishment of the neutral zone of 30 yards.

Reference to the same schedule will also show the striking defensive effect which even a narrow strip of old grass will provide against tick advance. A month after the deaths of the animals in paddock B the edge of the strip of long grass showed many ticks visible, a much grosser state of infestation than existed elsewhere in this paddock. Frequent and exhaustive search was made, with due precautions, along the strip of closely-cut grass, but no tick was at any time discovered. It is evident, therefore, from the negative final result, the infection was unable to spread from the edge of the long grass by reason of the unprogressive character of the tick.

The utility of the belt of old grass—as illustrated in the schedule and in the foregoing experiment—as a defensive screen should, therefore, be borne in mind, as it may possibly add to the resources of stockowners who are eager to adopt every known means to check the advance of the disease from any recognised focus of infection.

The above observations may be considered as comprising in part the natural means of spread of the disease and its check or limitation under normal conditions. Practical observations, however, have shown the tendency of the disease to travel long distances in a manner quite inconsistent with the gradual and progressive invasion likely to be caused by a slowly-creeping

insect such as the tick. These outbreaks clearly show the existence of some tick-transporting agency capable of carrying the carriers, and distributing them far distant from original foci of infection. With a view to determining with certainty some of these agencies of transmission, the following experiments were made:—

Human Clothing has long been under suspicion of mechanically carrying the disease from one spot to another.

In a country such as this, where native pedestrians travel long distances, passing perhaps through many farms in the course of a single journey, and not always confining themselves to well-defined roads, etc., the agency of the native as an unintentional factor in the spread of the disease has long been suspected.

The following experiment confirms this suspicion:—

Paddock J (*q.v.*), in shape a parallelogram, barely 100 yards in breadth was intentionally constructed to prove the point in question. It is isolated on all sides from risk or transfer of disease from contiguous paddocks by the double fence described before. About the middle of November two beasts (Nos. 105 and 106) were placed in this paddock, which was then permanently closed, the only access being by two stiles, one at either end. The disease had been previously introduced into paddocks B and F, and two animals had died at the commencement of November in the long grass at the upper portion of paddock F.

On 30th December (six weeks after the death of the first animal in paddock F) four natives were caused to walk directly through paddock F, along an old kaffir path,* and, climbing the stile leading into paddock J, to walk through this enclosure into B, and then to return by the same route to F.

On 4th January this procedure with two natives was again adopted, and again on 10th January, the men passing straight through paddock J and returning again to F.

On 17th January the evening temperature of one of the test animals was 104.3, and death from typical East Coast

* This kaffir path—shown on Map A by a dotted line—had been intentionally enclosed in the paddock for the purposes of the experiment.

fever occurred sixteen days later. The other animal contracted the disease a short time afterwards.

It is probable the infection was established by the first traversing of the paddock on 30th December, which, allowing a few days for the adult tick to find its host, would give a period of incubation of about fourteen days. The fact that no ticks were seen to attach themselves to the clothes or persons of the natives on this date cannot be considered satisfactory proof of their absence, as subsequent experiment tends to prove.

The appearance of the disease so promptly after the breaking of the quarantine is striking evidence as to the risk of conveyance of the infection, which is incurred by unrestricted foot traffic through an infected area.

The conditions under which the experiment was conducted were, of course, exactly those which might be expected to lead to the conveyance of the disease, and it might be objected that such ideal conditions of spread rarely, if ever, exist in actual experience, or at any rate to an equal degree. While this, of course, is recognized, it will be remembered that the point to be decided with exactitude was the possibility or otherwise of the spread of the disease by means of pedestrians, a theory which now must be considered as having passed from conjecture to certainty.

Equally striking confirmation attended the endeavour to prove the agency of infested hay in the production of the disease. Long grass from paddock B was cut from a patch of about 50 yards in extent. This grass was cut with sickles, and well shaken and examined in the process. After drying, it was stacked, and appeared after close observation to contain no signs of tick life. The material was used as bedding for two healthy animals confined in a small enclosure provided with a shed, which had been erected on clean or uninfected ground. This bedding was first used on 6th February, and thirteen days after its use had been commenced, one of the beasts commenced to react, and in due course died from the disease. The other beast was at once withdrawn and sprayed.

In this way the theory of the possibility of transmission of the disease by the medium of hay was brought to proof under exact conditions of observation. Whether hay becomes divested

of its tick life by longer keeping is a point not as yet determined, as far as the writer knows. The preliminary experiments with ticks, as given in Schedule X, prove that these insects are capable not only of concealing themselves skilfully in the axils of the leaves, etc., of grasses, etc., but also that, once established on a certain tuft or stem of grass, their tenancy is very persistent. Doubtless, lengthy storage would divest hay of its dangerous properties, but in the absence of exact knowledge as to duration of tick life under such conditions, it would seem inadvisable, whatever its age, to use—either for feeding, bedding, or packing purposes—any hay drawn from a spot or locality under suspicion.

While the above agencies (viz., human traffic and hay) have been looked upon as such probable factors in the transmission of the disease, as hardly to need scientific proof, the theory of the agency of animals, especially sheep, has been more open to question, no direct evidence—so far as the writer knows—having been brought forward in support of the suspicion. The question must, in the light of the following experiment, be considered as definitely decided.

A small flock of twenty-five sheep was turned into paddock B and herded in its lower part. At night they were folded in a small shed in paddock C. This shed was also used at night time by two beasts which had occupied this paddock for some three months. Ten days after the first entry of the sheep into this shed, the disease broke out in paddock C. As no other agency could have been concerned in this appearance of the disease, the conclusion is unavoidable that the infective tick attached itself during the day to the sheep grazing on the contaminated ground, and that it was transferred in the sheep's fleece to the shed where the animals were folded at night, there leaving the sheep for attachment to its more congenial host, the ox. The agency of the sheep in this case would doubtless be that merely of a mechanical transporter of the tick, inasmuch as complete attachment would have divested it of its infective power. The point which seems of significance is that ticks, which generally freely attach themselves to the sheep, are also capable of remaining unattached in the fleece, and of exercising some selective preference for their bovine host should the opportunity of transference present itself.

The movement of undipped flocks through clean farms or areas, or even from one paddock to another, must in the future be the subject, under certain conditions, of increased caution.

The hide of a beast dying from East Coast fever has always been an object of suspicion as regards its infective potentialities.

In order to confirm or disprove the theory a hide was removed from a beast dying during the night or early hours of the morning of 4th November. The animal, which showed a considerable degree of tick infestation, and was, of course, undipped, was skinned about 8 a.m., and the hide laid, hair down, upon the grass in a clean enclosure. Three healthy beasts were then picketted at different points round the spot, and at such a distance that they could approach within 6 feet of the hide itself. They remained in these positions for seven weeks without contracting the disease, and were kept under observation for a period of fourteen days after their removal. No disease developed in any of these animals.

The intention of exposing the test animals shortly after the hide had been put in its place, was to provide facility for the attachment of any ticks leaving the hide unengorged, or only slightly fed, and seeking reattachment to another host. The period of seven weeks during which the animals remained close to the spot, was a sufficient period to have allowed of the moulting of any larval or nymphal forms of ticks remaining attached to the hide, and of their assuming an active and hungry stage. The fact that no infection followed such close contact, would seem to prove that no such potentially infectious forms escaped from the hide, otherwise infection would appear to have been inevitable.

The writer's opinion is that all engorged or sufficiently fed larvae or nymphs left the hide at, or shortly after, the death of the beast,* and several hours before the removal of the skin, and that ticks which at the time of skinning remained attached or crawling, were unable to mature owing to the absence of nutriment, and possibly to the commencing drying of the skin. If this theory were correct, it would appear that a process of natural "disinfection" so to speak, occurs in the hide of a beast dying from the disease.

* The hide was occasionally turned over, but no adhering ticks could be detected twenty-four hours after its exposure.

While it seems right to quote the results of the above negative experiment in reviewing the various factors which have been credited as agents in the dissemination of the disease, it seems that too much significance should not be attached to the results of the test, inasmuch as no accurate observations could be made in the case as to the exact time elapsing since death, it being conceivable that by the anticipation of a few hours a positive result might have been secured.

The experiment also (beyond adding something of a negative nature to our sum of knowledge concerning the disease and its means of spread) cannot claim any practical application to our systems of eradication or control, nor would it seem expedient to modify existing restrictions concerning the dipping, etc., of hides before removal. Such articles—apart from the question of any original inherent danger—must always be looked upon as an ideal medium for the carriage of ticks, should the means for reinfestation be present, and the complete disinfection of the skin of the beast dying from East Coast fever must continue to be considered as of paramount importance.

Turning from the foregoing observations on the prevention, eradication, and means of spread of the disease East Coast fever, it may be of interest to quote certain observations undertaken in the endeavour to show the ease and rapidity with which paddocks of moderate size can be divested of their ticks, provided systematic and sustained efforts are made towards clearance under a system of short-interval dipping.

The extinction of the non-pathogenic or uninfected tick from large areas—or even its reduction within reasonable limits—has generally been looked upon as a well-nigh impossible task, or one only to be achieved by an irksome system of dipping extending over a period of some years.

The following experiment will show, however, that the end can be attained with certainty and rapidity provided the owner is prepared to take the necessary trouble. Schedule XI gives a rough ground plan of paddock A, adjoining the paddocks shown on map 1. The extent of this enclosure is about ninety acres, its contour very irregular, and the vegetation at its lower part dense, with much long rank grass.

This paddock, which contained many ticks in its lower parts, was roughly divided by pegging off (with fencing

standards), the corners of squares having sides of about 200 yards in length. In certain parts the contour of the ground was such as to prevent the sub-division into rectangular figures, but the superficial area of such irregular divisions was roughly made to comprise the same extent of ground, viz., about eight acres to each plot. These plots, or sub-divisions, were numbered as shown in Schedule XI, and each plot was grazed for a period of three days by a small herd of cattle (about thirty-two in number).

At the expiration of the seventy-two hours grazing, the herd was driven down and passed through the dip, after a careful count had been made of the number of ticks present under the tail and in the brush. The beasts when dry were returned to the next plot, and confined roughly within its limits during the day by two native herds, at night the cattle were at liberty to graze anywhere within the paddock.

In this manner a *systematic* grazing of the whole area of the paddock was ensured during the hours of daylight, a period which Schedule XII shows to be the most important time in consideration of some form of tick attack. After the three days' grazing, each plot remained unoccupied, while the eleven remaining plots in their turn were being grazed—a period of about thirty-three days occurring from one occupation to the next.

In spite of their restricted grazing ground (or perhaps by reason of it) and in spite of their regular dipping every three days, the herd remained in excellent condition, as the frontispiece to this report, which was taken after their sixtieth dipping at seventy-two hours interval, will serve to testify.

It will be seen that the numbered plots of Schedule XI enclose the dates upon which they were grazed, and the figures against these dates give the average of the number of ticks found upon the beasts and brought away from the plot to the dip. The decrease is interesting, and shows in a marked manner the effect which one short period of three days grazing will produce upon a given area, and the consistent diminution in tick life brought about by each repetition of the process.

Any question as to the practical tick-killing properties of the three-day dipping fluid would be answered as directly by

these results as by the restraint exercised on infected ticks in the foregoing paddock experiments.

It is, of course, remembered that the above results were attained during summer weather and while good grazing was available, and it is not thought that the exact details of the experiment could be applied without adjustment under all conditions of season and veld.

Like much of the foregoing work, however, the question of exact applicability to every condition has been less a matter of concern in this experiment than the establishment of standards of comparison which may serve—though applied under differing conditions—to guide those seeking to suppress the disease East Coast fever, or eradicate the tick.

In the attempt to compute the actual efficiency—i.e., the extent of damage to the tick—of any dipping agent it must not be forgotten that the visible result (or the number of dead ticks found) is only a part of the actual effect produced (see Schedule V). This point was called attention to in Part II of this report, where it was shown (Part II, page 8, Schedule B) that the effect of a dipping remained for several days after immersion, and that ticks which attached themselves during the persistence of this residual effect, would—though undipped—succumb in large numbers if the dipping of their host had previously been carried out at short intervals in an arsenical solution of a strength properly adjusted to the interval of time between immersions.

In the endeavour to compute this residual effect in the case of the three-day dip, a number of observations were made (see Schedule XIII) from which it will be seen that the effect—though still serviceable—is considerably less than where a dipping fluid of double the arsenical strength is used (as in the Laboratory dip). This diminution of the residual or sustained killing effect in the new dipping fluid seems at first a serious drawback, until it is remembered that the need for such sustained effect is done away with almost entirely, no tick once attaching itself to the beast being able to escape immersion.

Where dipping is practised once every week, the need for such prolonged action is more apparent, although, as stated above, instances must even here occur of ticks escaping and living to spread the disease.

Such cases, however—from the wide practical results secured—must be of rare occurrence only.

Reference to the Schedule XIII will show that the residual effect established by the use of the weakened dip, is responsible for the death of 16.8 per cent. of the adult ticks attaching themselves in the short interval before the repetition of the dipping process.

A point of some interest coming to light in the above connection, was the higher degree to which—under identical conditions—this sustained or residual effect became established in the case of the horse, in which animal the percentage was 22.5 per cent., or nearly 6 per cent. greater than in the case of the ox, such percentages being derived from 220 observations in the horse, and 107 in the ox. The writer is at a loss to suggest an explanation for this unexpected result unless upon the assumption that the rate of elimination of the arsenic in the layers of the skin is greater in the ox than in the horse. The existence, in any case, of a difference to the above degree would seem to point to the fact of some vital (physiological) difference in skin activity, rather than a difference in capacity for mechanical absorption (under which theory the thicker skin of the ox would seem likely to prove more absorbent and more tolerant, and be capable, therefore, of exerting a more pronounced residual effect).

The predilection of the brown tick for certain sites or regions of the body has often been noted by observers in the past, and the frequency with which ticks attach themselves to the extreme end of the tail, among the long hairs of the terminal tuft, has led a number of farmers to remove this tuft with the intention of reducing the incidence of tick attack at this spot, it having been observed that if the hair at the end of the tail is removed, the number of ticks found in this situation is considerably lessened.

It was desirable to observe—in view of the increasing prevalence of the custom of removing the tail tuft—whether any advantage really attended such removal. The disadvantage, from the animal's point of view, is obvious enough, especially in close warm weather when flies are troublesome, and unless the operation can be proved of utility, its further adoption seems inexpedient.

Accordingly, a series of tests was instituted in two small herds or lots of fifteen beasts each, both of which herds were grazed together under identical conditions. In one lot of cattle the hair was clipped from the tail, while in the other case the tails were left long and untouched. These two herds were brought to the dip every three days, and the occasion was used to count the numbers of ticks collected in this period by the two herds respectively. From the Schedule XIV, it will be seen that the efficacy of the tail tuft as an agent for the collection of ticks is considerable, and that by its means 66 per cent. more ticks become actually attached to the long-tailed beast than to the beast with the tuft of hair removed. This is a point of no small importance where an endeavour is being made to clear up tick-infested pastures, and it is evident that no good purpose is served by avoiding to a great degree the attachment of the insect, if by such avoidance more than a third of the ticks which should have been secured and brought to the dip are left behind to indefinitely continue the infestation of the ground.

It seems, therefore, that the practice of the removal of the tail tuft is one which should be discontinued, in the interests both of the owner and his beast. At the same time the fact should be recognised that the hairs of the long tail serve to some extent as a defence to the tick against the action of the dipping fluid. It is, therefore, desirable to dress the end of the stump of the tail occasionally with a little of the compound mentioned in Schedule VII, as by this means any clumps or aggregations of ticks (which it should be specially noted are often resistant to the action of the dip) will with certainty rapidly become destroyed.

One of the great objections which has been brought forward by the opponents of short-interval dipping is the alleged inability produced in working oxen, by which after dipping they are prevented from working for a long period. Such an objection has been greatly overstated, and the difficulty (which to some degree does exist with oxen unaccustomed to dipping) rapidly disappears as such animals become habituated to the process and tolerant of the presence of arsenic in their coats.

The general agreement of opinion amongst those who have regularly adopted the short-interval system of dipping in Natal, is that oxen can either be worked in moderation shortly

after emerging from the dip, or can within a few hours perform their usual work, provided an outspan during the hottest hours of the day is afforded. The weight to be given to this objection, therefore, will be able to be judged at its proper worth, but the stock-owner really desirous of saving his cattle from the inroads of the disease, is urged to base his action upon practical results rather than upon the fears or prejudices of those opposed to the adoption of dipping measures.

The writer has had no opportunity of determining to any satisfactory extent the efforts of the new three-day dip upon the working capacity of oxen, but there seems no reason to doubt that whatever difficulty in this respect may have existed in the past will be much reduced by the use of a fluid in which the percentage of arsenic is reduced by one-half, even though its application is more frequent. This opinion is based upon the ease with which cattle and horses (entirely unaccustomed to be dipped) will tolerate immersion every three days without any loss of condition, and also upon the reduced residual or accumulated effect (dealt with above) which is found to attend the use of the weaker dip—an effect in all probability in close relation to the question of temporary inability under consideration.

Recognising the inconvenience likely to be experienced by sheep farmers in the maintenance of two dips (one for sheep and one for larger stock), necessitating the use at times of two different dipping fluids, an endeavour was made to adopt the Laboratory dip for use as a sheep dip. It was found, however, that the usual arsenical percentage was too high to be safely employed, except at somewhat lengthy intervals. The reduction of arsenical strength employed in the three-day dip appeared to overcome this difficulty and permit of its use as frequently as occasion demanded, while the soap and oil constituents of the dip promised to prevent the abstraction of the natural fats of the wool likely to follow the use of an alkaline dip (such as arsenite of soda alone uncombined). Weekly dipplings in the three-day dip of a small experimental flock of clean sheep being tolerated for a lengthy period without any inconvenience or disability, it was necessary to observe the more important question of the action of the dip on sheep affected with the disease scab.

This disease was, therefore, harboured and promoted among a large number (some 160 merino sheep), and was allowed to spread until this experimental flock was very badly affected.

Schedule XV will give the more precise details of the experiment, but it may be said here that by a repetition of the process of dipping (which did not in the least affect the health or condition of the flock), the disease was rapidly eradicated, since which time the entire flock has passed through the dipping tank, being completely immersed each time, without the loss of a single sheep, the number of such weekly dippings totalling eighteen up to the present.

It would appear, therefore, that the three-day dipping fluid will be found to be adapted well to the requirements of the sheep-owner, who—if possessed of a full-sized dipping tank—can, with a minimum of trouble, arrest the first signs of an outbreak of scab in his flock by passing his sheep or goats through the same dip as that which he is using in the endeavour to fight the disease East Coast fever, or clear his farm from ticks.

If stock-owners once recognize the fact that by the adoption of any system of dipping they will be able:—

- (1) To check with certainty, and with little or no loss, an invasion of East Coast fever;
- (2) to arrest with certainty and ease any manifestation of the disease scab in their flocks; and
- (3) to look forward with confidence in the near future to the practical eradication of the disease-producing tick from their farms;

the greatest problem affecting the agricultural welfare of South Africa will be well advanced towards its solution.

Such a system has been attempted to be outlined in the three parts of this “Report on Dipping and Tick Destruction,” of which the above is the concluding part.

The question of *time*, or the adapting of the dipping process to the life history of the tick, has been considered as the essential point of these observations. Such adaptation has necessitated the revision of the composition of the generally-used dipping fluids, in order to permit a much more frequent

repetition of the process than that usually practised, a repetition which, while harmless to the beast, must be lethal to the tick in all its active phases.

For ordinary use as a precautionary and tick-destroying method, in the absence of specific disease, the use of the formula (given in Part I of this report under the name of the Laboratory Dip) will be found to answer the purpose for which it was arranged, viz., that of a regular five-day or weekly dip or spray, and the writer—encouraged by the results which have attended the use of this dip—recommends its continued use in circumstances where no urgency exists.

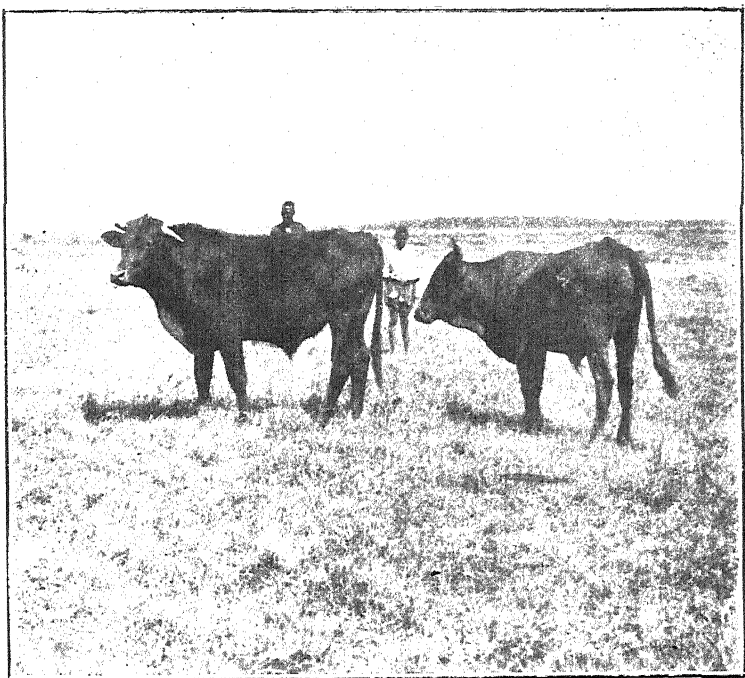
Good results will be found to attend the use of such of the proprietary dipping fluids now on the market as have been altered to meet the short-interval requirement, which our increasing knowledge of the tick and its habits has rendered imperative.

Where, however, the disease East Coast fever is threatening a district or farm which is well fenced, and in all localities where the eradication of the tick pest is a matter of serious moment, the writer strongly urges—even at the expense of increased routine trouble—the adoption of the still shorter interval of three days, confident that the outcome will be greatly to the advantage both of the individual and of the community.

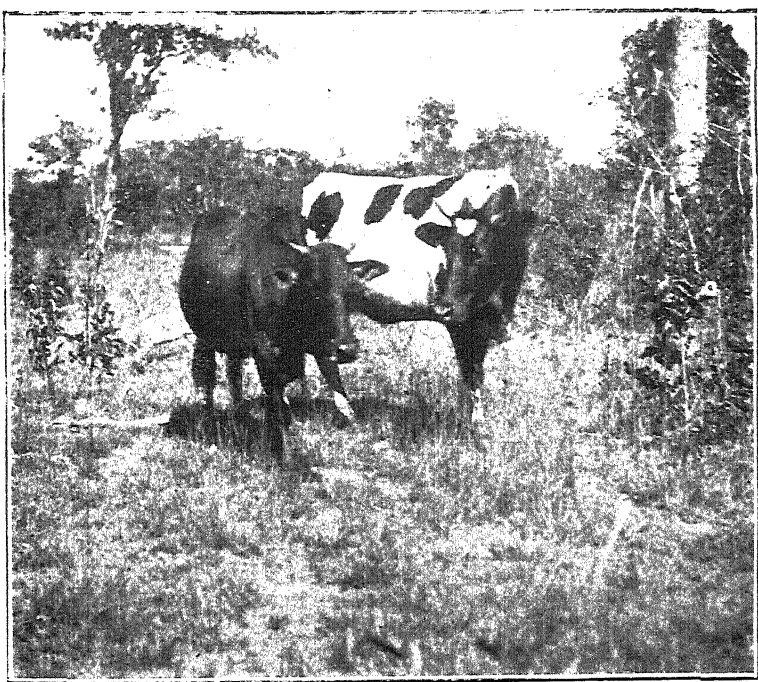
H. WATKINS-PITCHFORD,
Government Bacteriologist, Natal.

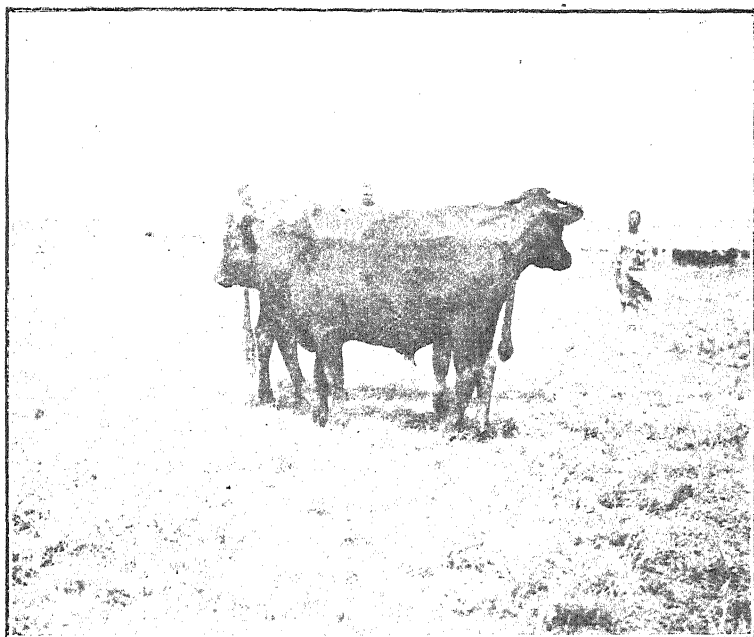
It is again my duty to express an indebtedness to my Veterinary Assistant, Mr. A. W. Shilston, M.R.C.V.S., both for his valued assistance in the foregoing work and for the many suggestions with which he has advanced the inquiry.

[Owing to want of space the Schedules will appear in the next (February) issue of the JOURNAL.—Ed.]



*Two-year-old half-bred Shorthorn and three-year-old Victoria Ox.
Both veld reared, on Darwendale.*

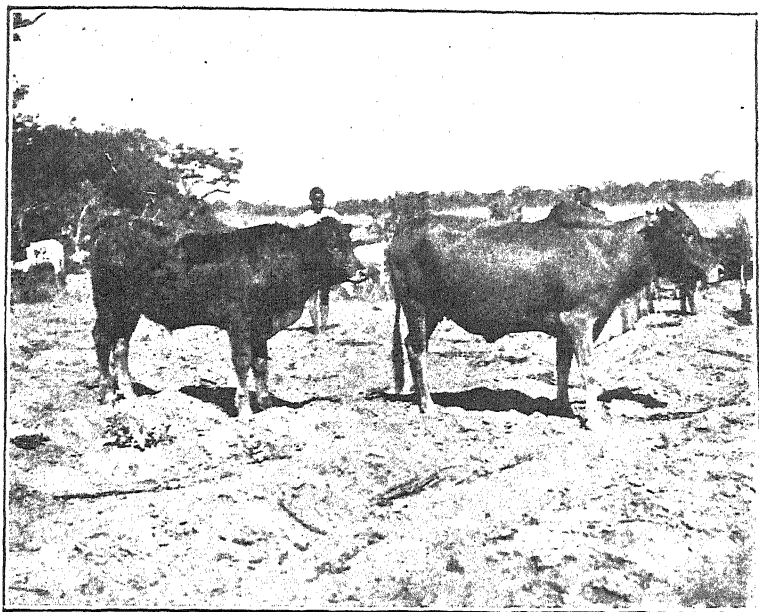




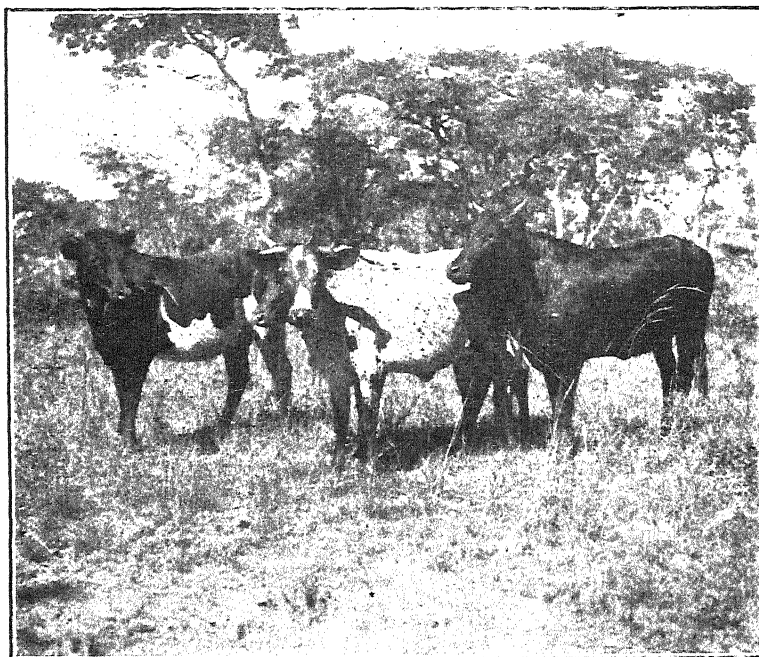
Seven-months-old half-bred Polled Angus Calf, with Africander Dam.



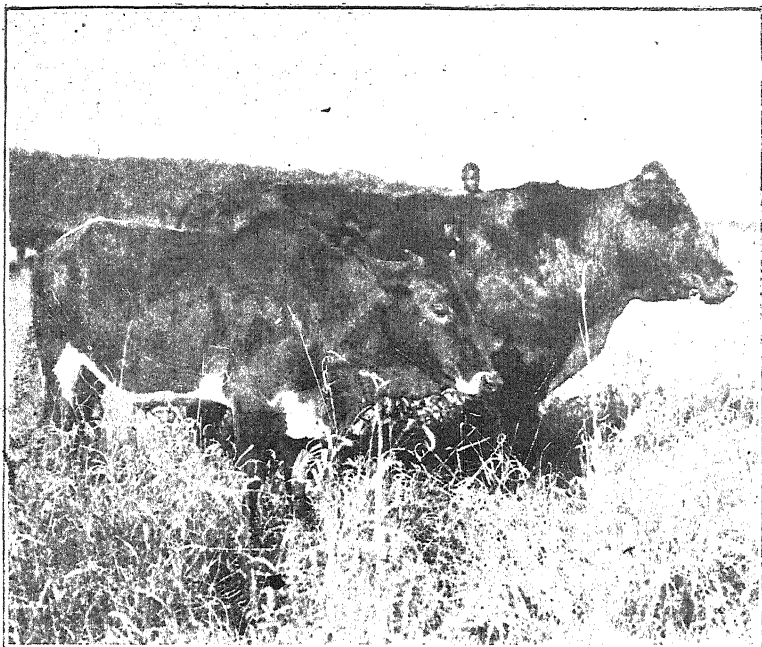
*Seven-months-old half-bred Shorthorn Calf with Dam.
Run on veld only, from birth.*



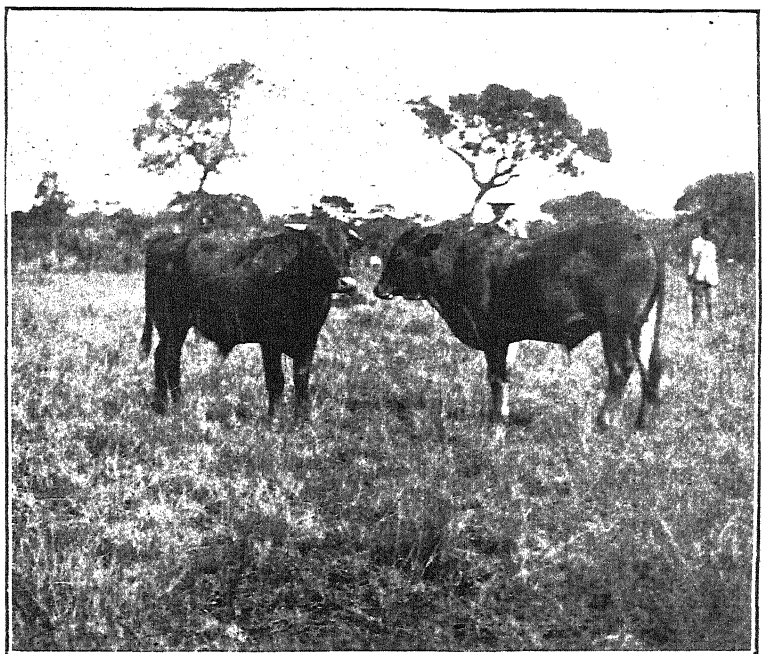
Seven-months-old half-bred Shorthorn Calf with Native Mother.



Yearling half-bred Shorthorn Heifers with type of Native Mother in centre (white spotted).



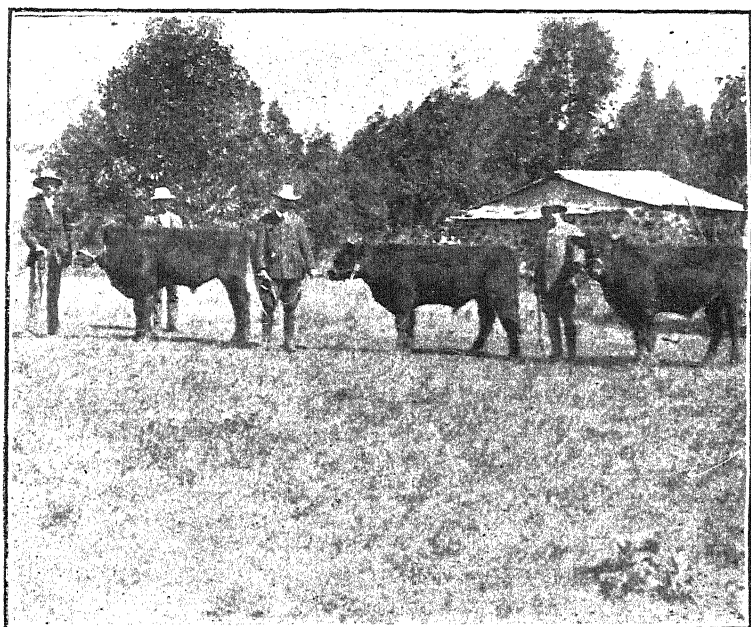
*Two-year-old half-bred Shorthorn and four-year-old Native Ox.
Both bred on Darwendale under same veld conditions.*



Two-year-old half-bred Shorthorn and same aged half-bred Africander



*Darwendale.—Fourteen-month Polled Angus Bulls, "Lord Elbleem,"
"Knight Errant" and "Touchstone." Imported through
Mr. W. H. Williamson, Salisbury.*



Coates Scotch Shorthorn Bulls on Darwendale.

Stock Raising.

By OTTO ZIMMERMAN.

The purpose of the present article is not to advance the interests of the Shorthorn breed in Rhodesia, as I believe from practical experience it can well hold its own without any assistance from individual farmers, by quotations from this or that country to prove its qualities. That it is the premier breed of the world no one can deny, and given fair and suitable conditions there is no reason why it should not repeat the triumphs of other countries in Rhodesia.

The first principle to recognise is, that success attends the breeder's efforts more from his individual work than from the selection of this or that bull of a particular breed.

The illustrations accompanying this article speak for themselves, and show what astonishing results can be achieved by the stockman willing to devote time and skill to his work.

The two-year-old heifer has made better growth than any I have seen imported from the Cape, and seeing that it and the yearlings in the other photograph are from Cape Shorthorn bulls of no special breeding, the result is decidedly promising. The seven months' old Shorthorn and Polled Angus calves are by Scotch pedigree bulls, and the better blood is fast asserting its superiority over that of the Cape.

All the animals were photographed in June, and are veldt fed, with no additional ration, running with their mothers from time of birth.

With the liberal terms now offered by the British South Africa Company, it is within the means of all to advance, but that does not begin and end with the purchase of a bull.

Cattle breeding on many farms to-day is a fallacy, and only shows what a marvellous country we have in the fact that a man pulls through and his stock continues to increase.

Four years ago I admit I was doubtful as to the possibilities of this being even a great beef raising country, and it was only after the study of Australian and American principles that I could find out where we were wrong, and what were the means of getting on the right road.

To begin with, no man can expect to keep his cattle under the same conditions as a kaffir, and at the same time introduce good blood. If he cannot alter his methods, it would be far better and safer to remain with a native or Africander bull. But who cannot alter his methods? And the old saying of "where there's a will there's a way", never wanted more application than in this. On how many farms does one hear or see the most useless boy put on herding, he is fit for no other work, yet he is good enough to trust with—in many cases—half the farmer's capital. I maintain, and have always carried it out, that the best and most intelligent native must look after the stock, and he is the highest paid servant on the property; a system which has never been regretted, and always paid well. Were this applied oftener, and a little more time spent on teaching him his duties, one would not see so often the favourite ant-heap with its fire on top, surrounded by a well worn and well fed down patch of grass, which is visited day by day until the cattle themselves are trained to stand in a bunch, and when hungry feed close around, any movement in the direction of new ground being arrested by a whistle or stone. Often in travelling through the country one wonders why do we kraal cattle at night. Very few lands are more sparsely populated, very few have less cultivated ground, and yet, night after night, the weary animals tramp home, to be shut up hungry until morning, when the same long trek is done again. How many stop to think why it is done? I am afraid if they did they would have no reason to give except custom; our neighbour does it and so we do it. The very time of the year, winter, when young and growing stock want food most, there are, with few exceptions, no crops growing, and I am sure if a few tried it for a spell, it would not be long before they were convinced of the benefit. Cattle do not stray naturally, but in search of food, and even if they had gone in the morning, the full paunch would well repay the little trouble in following them up,

In the same manner, a kraal is used to keep calves from their mothers, it being considered that if a calf gets a drink night and morning all is done that is required. Turn anywhere you will and pause to think what would be the result if young buck, pigs, or foals, or even children, were treated in this way. A calf will not drink more than is good for it, nature has provided for this; but it is surprising how much it can consume given frequently and in small lots, and still more surprising is the result. Another reason given for keeping calves up is that they are run off their legs, but it should be the rancher's duty to see they are not, by letting the cows graze near food and water, which should be specially reserved for this purpose. A calf treated in the above manner sleeps all day, waking every hour or so to drink, and will indulge in a good gamble at sundown from the day of its birth.

The burning of grass is another point which has to be tackled sooner or later. We cannot stock the land, expecting the pasture to improve, and at the same time adopt methods of the most primitive fashion.

No fires mean the spreading of the finer and the better grasses, the conservation of humus and moisture, while the best soil constituents are held up by the mulch thus formed. On the other hand, fires mean sluits, dried vleis, impoverishment of the land and coarse grasses.

In conclusion, let me add, Rhodesia is often spoken of as one of the best cattle raising countries; all authorities are convinced and united on this point. And yet we can only produce a 400-lb. beast in 4 to 5 years. It remains with the man on the land to alter this, and by his work, be it good or bad, progressive or retrogressive, Rhodesia will be judged in years to come.

[Editor's Note.—We are indebted to Mr. B. Winder for the excellent photographs of Darwendale cattle, used in illustrating this article.]

Bacon Curing on the Farm.

By: LOUDON M. DOUGLAS, F.R.S.E.

Notwithstanding the fact that there is likely to be a number of bacon curing factories in the immediate future in Rhodesia, there are many farmers who are still anxious to learn how to conduct bacon curing on the farm. They fancy that there is always a special value attached to farm-cured meats, as distinguished from those cured in a bacon factory, and while they propose to support any bacon factories which are established, they are still inclined to carry on a little curing at home.

I have been asked over and over again for definite data on this subject, and am therefore sending out this leaflet so as to give such explanations as may assist those who wish to carry on this business at home.

The first thing to consider in bacon curing on the farm is the house or building in which the process can be carried on, and I may say that, so far as I have seen, there are very few places which are suited to bacon curing in the small way.

It is necessary, first of all, in slaughtering the animal, to make provision for the carcase to be hung in a cool place, and I would recommend that such a place could easily be constructed in the manner of a kaffir hut with poles and thatch; the poles can be set fairly close together so as to prevent the entrance of any wild animals into the hut. If the carcase is hung over night in such a place, it will be cool enough to be put down for curing the next day.

Under factory conditions, meat is really never put down in the curing cellar until it reaches a temperature of from 40° to 45° F., which can easily be ascertained by means of a small pocket thermometer, which is inserted in the fleshy part of the gammon or ham end of the side. If the meat is much higher than this in temperature there is some risk in the curing, but the risk may be modified if the pumping pickle is perfectly sweet and cool. The whole carcase should never

be hung up to cool. It should always be split down first, and the back bone taken out. In this way the cooling will be more rapid than if the whole carcase is hung up by itself.

The curing place on a Rhodesian farm would be in the dairy, or a portion of the dairy could be walled off for the purpose. Farm dairies should invariably be built of hollow walls, so that the radiation of heat inwards is reduced to a minimum. When this is the case, the internal temperature will be fairly low, and thus be suitable for curing.

I have already described the process of curing on the farm in detail in another place,* and this description has been reproduced in many countries. I cannot do better than repeat the essential part of it here:—

THE NECESSARY EQUIPMENT ON THE FARM.—The equipment necessary for bacon curing on the farm is small. The principal thing is to choose as cool a place for the curing process as possible, such as an outhouse or, better still, a cellar excavated out under any of the farm buildings; a small place will do. The floor should be laid with flagstones or cement, the atmosphere should be sweet, and the place should be dark but should be well ventilated.

The bacon pig will weigh about 217 to 224 lb. in live weight, and this pig will turn the scale at about 168 lb. dead weight—that is, with the offal, excepting the head, feet, and flake lard, removed. It will be necessary, therefore, to have a scalding vat for a pig of this size. A large half-barrel, tub, or similar vessel will do. In addition to this, a simple rope pulley block, a few wooden gambrels or spreaders, two or three 10-in. straight knives, a steel, a 20-in. back saw and a 10-in. cleaver will complete the tools required. The pig may be first stunned by striking it sharply between the eyes with a large-headed wooden mallet, and it is then slung, by means of a pulley block, which can be fastened to the branch of a tree or a cross beam, by one of the hind feet, head downwards, and a sharp 10-in. straight knife is inserted in the throat in the direction of the heart, so as to sever the main blood vessels. The blood at once rushes out and may be caught for use in making blood puddings or allowed to go

*“Bacon Curing on the Farm,” *Agricultural Journal of the Cape of Good Hope*, September, 1907.

to waste. In a few minutes the carcase will be quite free from blood, and may then be lowered into the large tub already spoken of. This tub should be previously filled with water at about 160° F., or just so that the hand cannot be held in it comfortably. The carcase is turned about in this water until the hair comes away easily in the hand. The two hind legs are slit, so as to expose the sinews, and these are loosened with the finger. A gambrel or spreader is then pushed in beneath them, and the carcase is hoisted again into the vertical position, head downwards. It is scraped all over quite clean by means of a blunt knife, or, better still, a pig scraper, cold water being thrown over it occasionally meanwhile, so as to cool it down as much as possible. A slight incision with a knife is then made between the aitch bones, and this is continued right down to the apex of the lower jaw. Next, the knife is inserted so as to sever the aitch bones, and the bladder and organs of gestation are removed. The crown end is then cut round and removed, along with the fat gut which has been loosened, right along the back. Then the remaining guts, stomach and fat are all pulled out. The liver and kidneys are taken out and are at once thrown into cold water, so as to cleanse them. The breast bone is severed by means of a saw, and the skirt is cut right round, as close to the flake lard as possible, and the heart and skirt are cut from the lungs and thrown into cold water to be cleansed. The lungs and wind pipe are removed through the severed breast bones and cut off at the base of the tongue, which is left in the head or may be cut out there and then, so as to be used. All these various parts have their uses on the large scale, and they can also be utilised to much advantage on the farm. The guts, or intestines, should be cleansed thoroughly, then salted, and they can be used for sausage making. The liver, tongue, kidney, heart, etc., can be used fresh. The stomachs, if well washed and cleansed, make a very palatable dish.

THE DIRECTIONS IN CUTTING UP.—The flake lard remains still in the carcase, and must be removed, so that when that is done the whole inside can be washed with cold fresh water. The flake lard, after cooling, should be cut up and rendered, so as to make melted lard for household use.

It is necessary now to split the carcase in two, and this is done by making a straight continuous cut just under the skin,

right down the back, from the root of the tail to the neck. The next cut is made deeper, on the right side of the back bone, making that side clear and without leaving much meat on the bone. The left side of the back bone is cleared in the same way, so that the two sides are now separate.

In factories, where the "dead weight" is taken, the head, feet, flake lard and back bone are all weighed in, but the remainder of the offal is not. If the pigs are weighed warm, a deduction of 3 per cent. is made for "beamage."

On the farm, however, these matters are of no interest, as it is assumed that the farmer proposes to utilise most, or all, of the carcase in his own household.

When the head, feet, back bone and flake lard have been removed, the sides are allowed to hang until quite cool. A cool, shady spot is best for this purpose, and, if possible, the carcase should be hung where there is a gentle current of air.

THE CURING PROCESS.—The next process is the curing of the meat. This cannot be carried out successfully unless the sides are cool and stiff. When this stage is reached they are taken down, laid on a table or a bench, and trimmed. The inside is scraped free from fat, and the neck is trimmed free from bloody pieces; the steaks (or "under-cut") are taken out, and are utilised forthwith in the free state. Pig steaks make a splendid curry. The neck bones and aitch bones are cut loose, and the spare rib and breast bones are taken away along with these. The tops of the ribs are also sawn off, and the blade bone taken out. The large blood vein in the neck is removed, and the sides will then be trimmed complete.

It is now necessary to have ready some additional apparatus. A small pickle pump is necessary, together with a supply of pickle and a salinometer to test the same. The pickle may be prepared the day before, so that it will be nice and cool. It is made from the following recipe:—

14 lb. salt
1¼ lb. saltpetre
1¼ lb. dry antiseptic (boron preservative)
1½ lb. cane sugar (pure)

Make this up to five gallons with water, boil, and skim till clear. The liquor should test 100° or thereby on the salino-

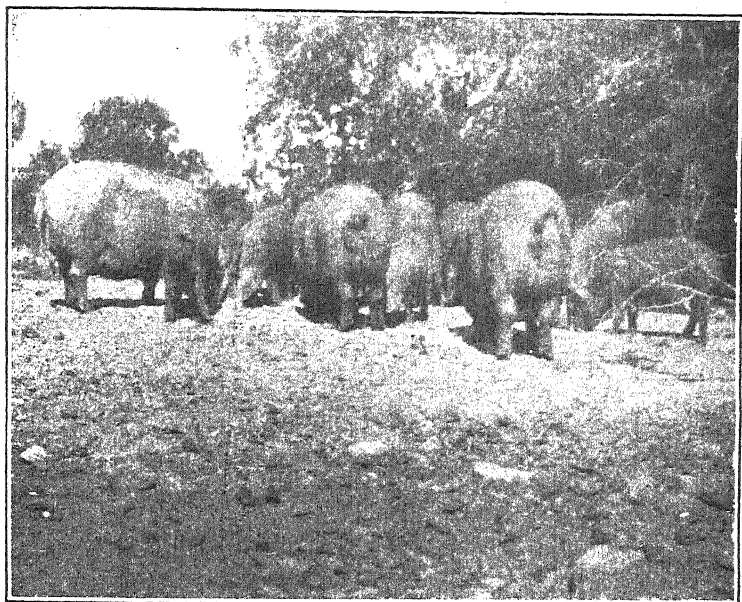
meter, and, if it does not, it should be made up to this strength with salt. In the absence of a salinometer, the density of the pickle is roughly ascertained by using a pig's foot or a sound potato. If either of these floats, the pickle may be assumed to be about right.

By the aid of the pump, this pickle is now injected into all the fleshy parts of the meat, and the sides are then laid on a bed of salt on the floor of the curing place. The bed of salt should be about an inch thick, and a wooden stave should be used to press up the belly part of the side, which should be uppermost.

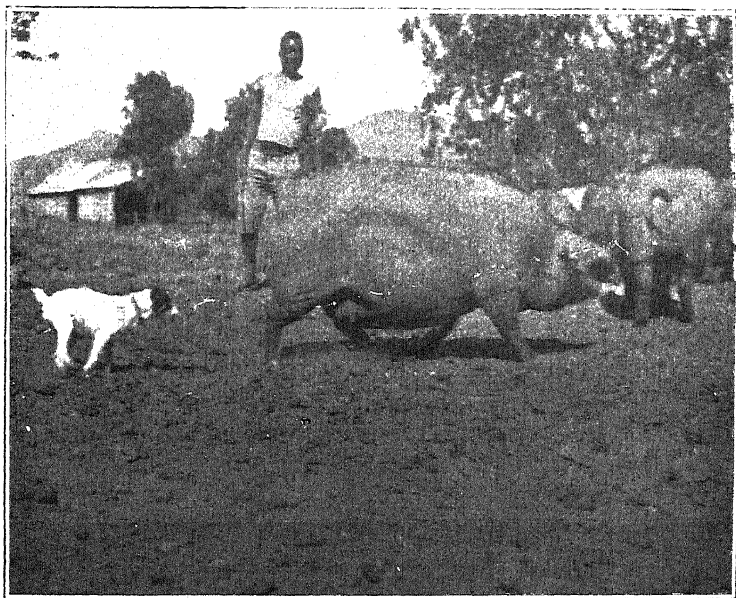
Now sprinkle all over the side an equal mixture of dry antiseptic and saltpetre, just sufficient to whiten it, and on the top of this put a heavy layer of salt. In fourteen days thereafter the bacon will be "mild-cured," for it does not require to be touched again, unless it has to be cured with the intention of keeping some months. Then, at the end of fourteen days, it will be necessary to add another dressing as before, and keep for another fourteen days. The resulting bacon will be salty, but it will keep a good many months quite fresh.

HOW SMOKING IS CARRIED ON.—When the bacon is cured, take it up from the curing bed and wash it in some cold fresh water; then hang it up so as to drain for a few days. If it is wanted as pale-dried bacon, it can be hung in the kitchen after dusting a little dry antiseptic all over it, especially into the pocket hole from which the blade bone has been removed. It will be ready for consumption at any time, but will get a more pronounced flavour the longer it is kept. Should it be desired to smoke it, an old barrel may be requisitioned. It will require to be so deep that the side can hang freely in it, and not come within two feet of the fire at the nearest point. An old tin can, which has had a lot of holes (2-inch) punched in it, is then filled with hardwood sawdust, and, after lighting it, the top of the can is covered with an iron plate, so that, as the smoke and heat come out, they do not ascend right on to the bacon, but curl round it. Three days may be taken to do the smoking, but that is a matter of taste.

A better smoke house can be made by building a small place about 4 feet square and 6 feet high, with a few bars



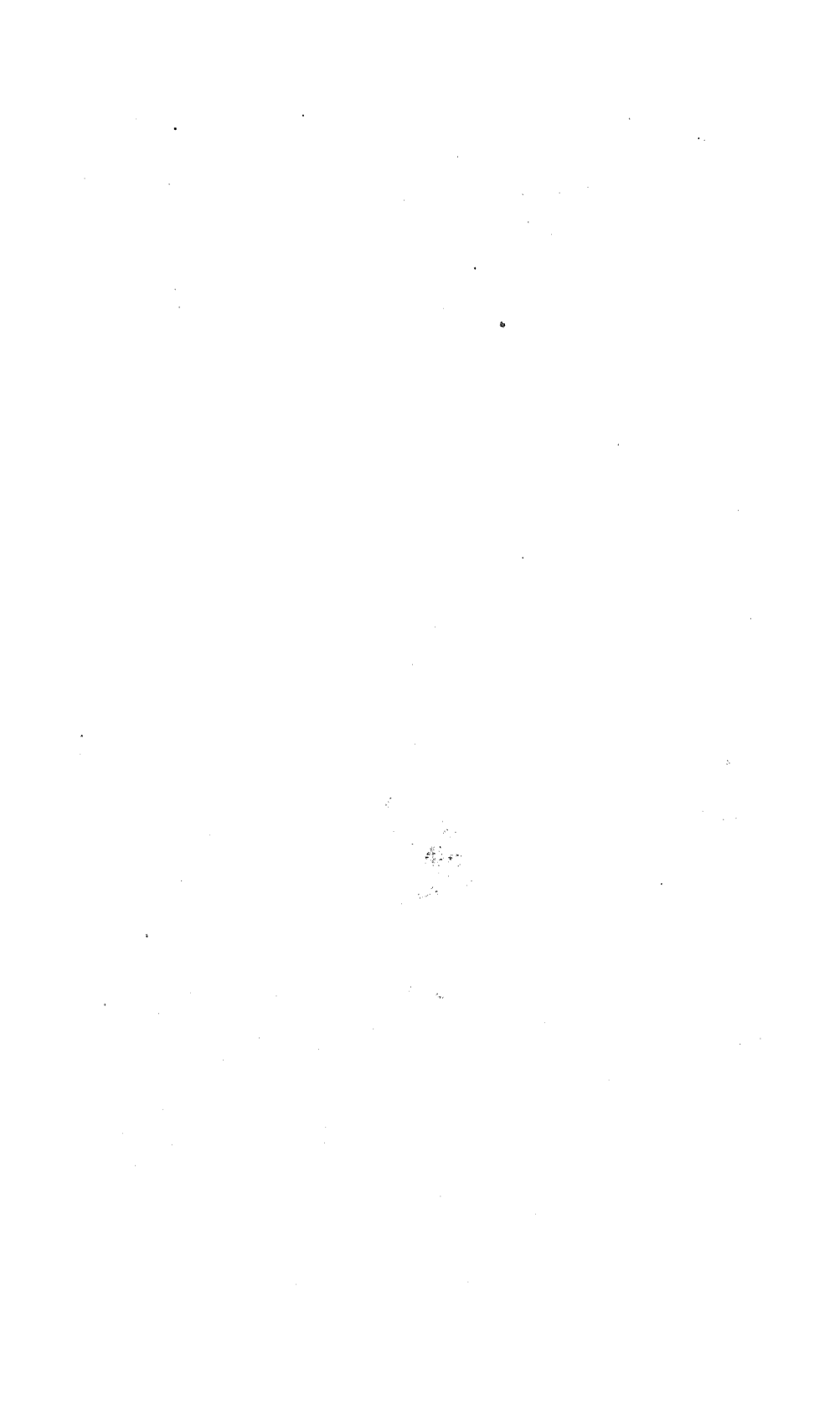
"Large Black" Pigs on the Premier Estate, Umtali.



"Large Black" Pigs on the Premier Estate, Umtali.



"Large Black" Sow, bred by Mrs. Marshall Hole, Salisbury



running over the top, to which the bacon can be hung. Such a place should have a small ventilator, but that may be considered too expensive for the small quantity handled. Smoked bacon will keep longer than pale-dried, because of the preservative qualities of the smoke.

HAM CURING.—In the curing of hams there is very little variation from the method of curing bacon. The ham is cut from the side and nicely trimmed. It is then thrown into a tub of the pickle already mentioned, and allowed to soak for two days, so as to purge it free from blood. The blood vein is then squeezed free from blood, and the ham is laid, shank downwards, on the floor in a bank of salt. It is covered with the curing mixture similar to the bacon, and is kept twenty-one days in salt for mild cure, and about fourteen days more if required for keeping a long time.

CURING IN PICKLE.—The foregoing description refers to bacon curing on the dry system, but it is equally effective to cure meats in pickle, in which case the same process is gone through as already described, up to and including the pumping; but, in place of laying the bacon down and covering it with salt and curing mixture, it is immersed in the pickle, and allowed to remain there for fourteen days for mild-cured meats, and 28 days for fairly salt meats. This length of time may even be extended, if it is proposed to keep the meats for many months. When the pickle-cured meat is taken out of the pickle it should be hung up to dry, and when dry may be kept in a dark cool place for nine or ten months.

Care should be taken always to keep cured meats of any kind in a dark cool place, and an additional precaution would be to cover the meats with clean fresh cotton, so as to prevent the attacks of flies.

Hams may also be cured in pickle, but they should always be first of all purged, as already described, in a separate vessel containing pickle, so as to get rid of the blood which is in the blood vein.

Hams always become tainted along the lines of the bones, but this can be obviated by careful purging in the manner described. When cured, they should be hung up in a cool dark place, and should be wrapped in cotton cloth in the same way as the bacon, so as to prevent the access of flies.

Importation and Distribution of Pedigree Stock from Great Britain.

As a tangible outcome of the decision to establish stud and stock farms in Southern Rhodesia and in order to meet the immediate demand for well bred bulls pending the time when such animals should be bred in the country; the following pedigree stock was shipped per s.s. "Laughton Hall" (Buchanall Steamship Co.) for Salisbury, Rhodesia, under the care of Mr. H. E. Brown.

15 Shorthorn Bulls	}	Purchased by John Thornton & Co., to order of B.S.A. Co.
15 Hereford Bulls		
15 Sussex Bulls		

5 Hereford Bulls	}	On behalf of private owners.
2 Hereford Heifers		
7 Sussex Bulls		
1 Red-polled Bull		
1 Lincoln Red Bull		

1 Shorthorn Bull (for private owner), detained on account of ringworm, arrived later.

The animals arrived safely in Salisbury, on 17th July, in excellent condition. They were offloaded at the Letombo Inoculation Station and, when sufficiently recovered from the confinement of the journey and somewhat accustomed to local conditions, were subjected to inoculation with a view to immunising them against red-water and gallsickness, endemic diseases of Rhodesia.

Letombo Camp is situated $4\frac{1}{4}$ miles east of Salisbury and is within 600 yards of the Umtali Railway Line. At the nearest spot on the Railway the B. & M. Railway authorities had constructed a ramp for the offloading of the animals.

At the Camp had been erected some two years ago 30 round huts, for the accommodation of the B.S.A. Native Police. These huts were built of green brick and thatched, and each was capable of housing two bulls. In addition to the huts

was a brick stable capable of holding eight animals, and another somewhat delapidated shed had been restored and made suitable for the accommodation of another eight animals.

The huts were found to answer the purpose admirably, being cool and well ventilated. The even temperatures of the animals stabled in these were in marked contrast to the unsteady records of those animals stabled in the sheds with roofs of galvanized iron.

The Camp being on sandy soil and the dry season prevailing, the question of drainage presented no difficulties.

The animals remained at the camp under treatment until the end of October, during which time each animal required constant individual attention. The work was carried out under the personal direction of Mr. L. E. W. Bevan, Government Veterinary Bacteriologist, assisted by Mr. John Cameron, Cattle Inspector, in charge of the camp, and three specially engaged cattle men.

THE INOCULATION—The success of the process of artificial inoculation essentially depended upon the keeping of the cattle free from tick infestation during the operation of a carefully selected and prepared virus. The bite of a single infective tick would have vitiated the process. The importance of this is instanced in the case of the two Hereford heifers which, on being detrained, became excited and unmanageable, breaking away on to the veld, where they remained four days. They were brought in covered with ticks and thereby contracted a natural infection from which one died and the other was saved only with the greatest difficulty.

It became necessary therefore to clear a road from the railway line to the camp, and to render the huts and camp tick-free. Veld hay that had been stacked for two years was used for bedding, and foodstuffs likely to contain ticks had to be excluded from the dietary. Foodstuffs had been brought from England with the bulls, consisting of 8,000 lbs linseed cake, 3,500 lbs English hay, and 800 lbs crushed oats and oatstraw. These foods were economised and gradually supplemented by local feeds, in order that when distributed the animals would take readily to Rhodesian diets.

Eventually the ration supplied to each animal per diem consisted approximately of 6 lbs green forage, 7 to 10 lbs pumpkins or melons, 2 lbs linseed cake, and manna hay *ad lib*. The total ration amounted to nearly 40 lbs per day. But it must be pointed out that the feeding of the animals was by no means a mechanical process, but that each animal received individual attention, and a diet based upon its requirements. The success of the inoculation, and the skilled attention given to the animals by all connected in the work, is well demonstrated by the fact that only one beast suffered from any digestive trouble from the day they left England until the time of delivery, and that the sum paid for drugs for the treatment of animals, which it must be remembered had been inoculated with two severe diseases, did not exceed £10.

Each animal was groomed and exercised daily, and thus became tractable and accustomed to native attendants. this exercise acted beneficially in stimulating the circulation, and counteracting the ill effects of long confinement and continued fever. The daily walks strengthened the feet, which had become mis-shapen and tender during the voyage

During the process of immunising the temperatures of all the inoculated animals was taken twice daily, morning and evening, and the records thus obtained will prove of immense scientific interest.

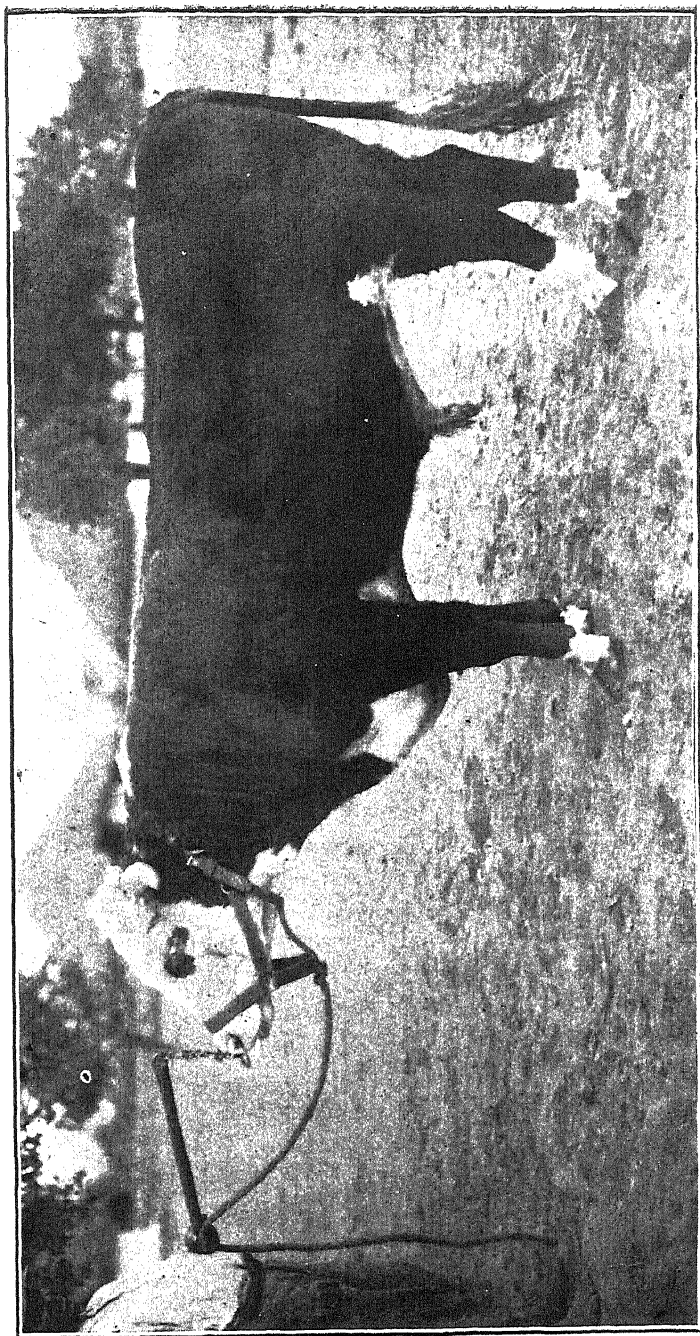
It may here be pointed out that although great improvements have been made in the process of inoculation, contrary to the general impression based upon the success achieved in this instance, the method has not yet become purely mechanical, inasmuch as each animal has been treated on its merits.

In all four deaths occurred, viz.: 1 Hereford heifer (which had become naturally infected); one shorthorn bull (privately owned) which died from the bilious form of anaplasmosis.

The bulls having been immunised, were ready for distribution. The selection of the animals was made according to priority of application and was associated with great difficulties, continuing in a desultory manner until the end of October. The original applicants were distributed throughout the country, and it was impossible for them to attend at

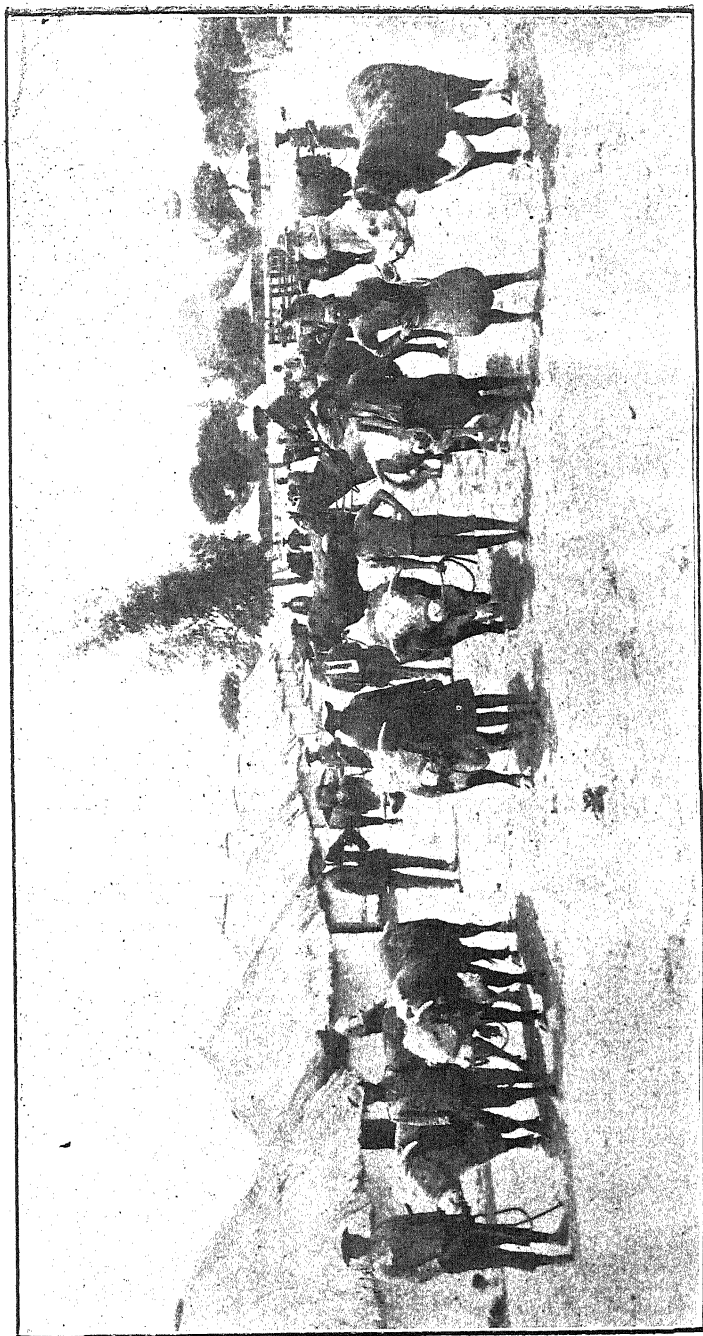


Sussex Bull "Bonfire King 3rd," bred by Mr. Joseph Godman. Purchased from the Department of Agriculture by Mr. A. Dobbin, Masoe.



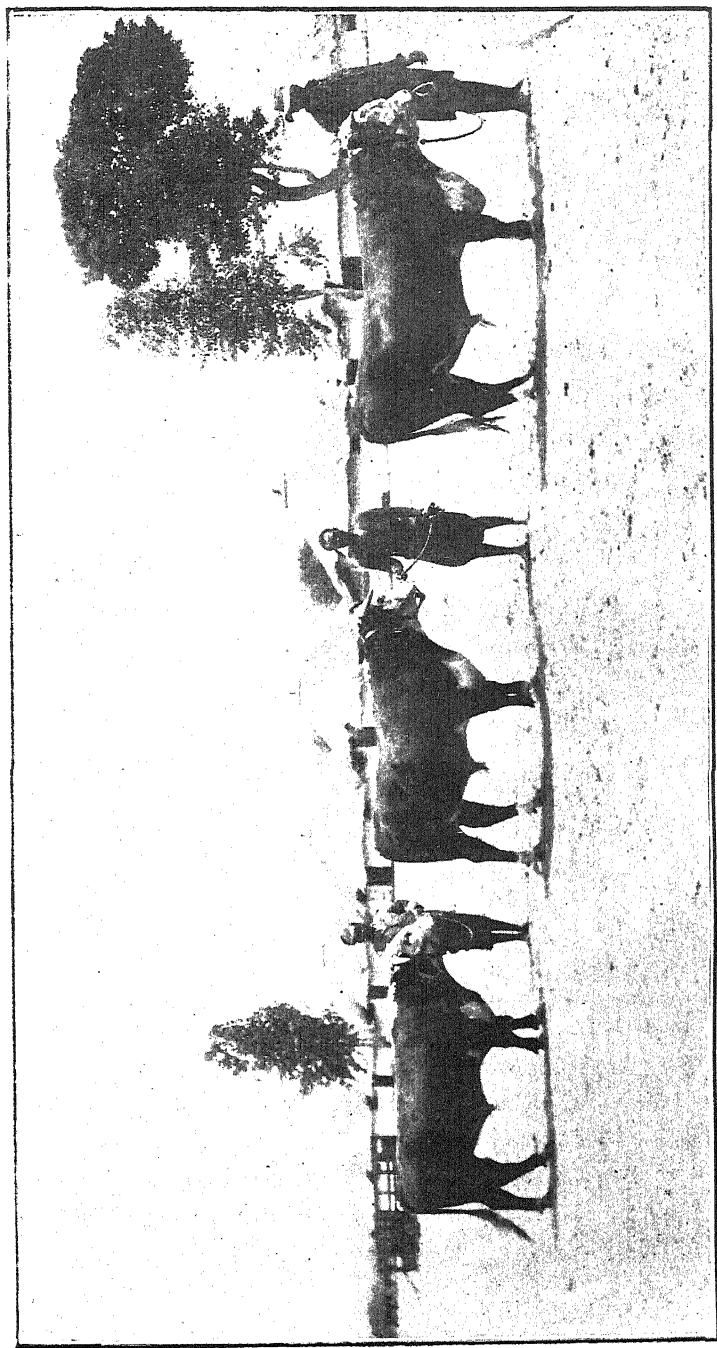
Hereford Bull, "California," bred by Mr. H. W. Taylor. Imported by the Department of Agriculture.





Latombo Camp.—Veterinary Staff and some of the bulls recently imported by the Department of Agriculture.





Hereford Bulls.—“Belmont,” purchased by Mr. J. Strachan, Mazoe; (centre), “California”; (right), “Peerless,” purchased by Mr. Jack Mack, Gatooma.

any one date. Eventually all the Government bulls for the South left in a single train on Monday, 30th October, under the charge of two white men and three natives. Other consignments were despatched about the same time to Umtali, Macheke, Mazoe and West Salisbury districts.

The bulls left the camp in good condition, fit and robust, and thriving under local conditions and on local feeds.

The following is a list of bulls, their breeders and recipients :

HEREFORDS.

BULL'S NAME.	BRED BY.	PURCHASED BY.	DISTRICT.
"Peerless" ...	His late Majesty King Edward VII.	J. Mack ...	Gatooma
"Shrawardine Abbot" ...	Mr. A. Tanner ...	E. R. Kirkwood ...	Lomagundi
"Shrawardine Wellington" ...	Mr. A. Tanner ...	G. T. Dyke ...	Makwiro
"Oney Bacho" ...	Mr. F. D. Bach ...	P. H. Gresson ...	Salisbury
"Flaxman" ...	Mr. W. Tudge ...	R. L. Gray ...	Mazoe
"Victor 23rd" ...	Mr. G. H. Green ...	D. H. Newitt ...	Salisbury
"Spark 40th" ...	Mr. G. H. Green ...	W. D. Estment ...	Plumtree
"Dauphine 55th" ...	Mr. G. H. Green ...	A. Moorcroft ...	Mazoe
"Marquis" ...	Mr. W. C. Boulton ...	P. Brocklehurst ...	Umvuma
"Briton" ...	Mr. W. C. Boulton ...	W. B. Colling ...	Salisbury
"Hardwick Lad" ...	Mr. Richard Bright ...	L. Blume ...	Redbank
"Belmont" ...	Mr. Richard Bright ...	J. Strachan ...	Mazoe
"Achates" ...	Mr. H. W. Taylor ...	H. A. Bradley ...	Gwelo
"Nestor" ...	Mr. H. W. Taylor ...	Major C. A. Shaw ...	Salisbury
"California" ...	Mr. H. W. Taylor ...	Beamish Bros. ...	Nyamandhlovu
*"Pyon Monitor" ...	Mr. W. T. Cooke ...	J. Meikle ...	Umtali
*"Sinbad" ...	Mr. A. E. Hill ...	G. Mitchell ...	Bulawayo
*"Great Scot" ...	Mr. J. K. Hyslop ...	G. Mitchell ...	Bulawayo
*"Dauntless" ...	His late Majesty King Edward VII.	G. Mitchell ...	Bulawayo
*"Lawton" ...	Mr. A. J. Dent ...	G. Mitchell ...	Bulawayo
*"Docile" (heifer) ...	Mr. H. R. Evans ...	J. Strachan (died) ...	—
*"Myrtle 2nd" ...	Mr. G. Butters ...	G. Mitchell ...	Bulawayo

SHORTHORNS.

"Red Favourite" ...	Duke of Northumberland	C. H. Bell ...	Hartley
"Western Rover" ...	Duke of Northumberland	Died ...	—
"Lesbury Sweetmeat" ...	Duke of Northumberland	Died ...	—
"Mountain Rover" ...	Duke of Northumberland	L. Loforte ...	Hartley
"Good Luck" ...	Duke of Northumberland	F. R. Greenway ...	Umvuma
"Baronet" ...	J. Durno ...	Cecil Roberts & Letts ...	Bulawayo
"Favourite Pride" ...	J. Durno ...	Gwebi Experimental Farm	Gwebi

SHORTHORNS—*Continued.*

BULL'S NAME.	BRED BY.	PURCHASED BY.	DISTRICT.
"Bransby's Judge" ...	Mr. J. M. Strickland	... M. E. Weale	... Shangani
"Bransby's Premier 2nd" ...	Mr. J. M. Strickland	... Lt.-Col. O. Baker	... Old Umtali
"Aerial Knight" ...	Mr. T. D. Peacock	... W. C. Morgan	... Nyamandhlovu
"Mountford Victor" ...	Mr. T. Minton	... Raubenheimer & Balne	... Enkeldoorn
"Mountford Vandyke" ...	Mr. T. Minton	... E. H. Waller	... Salisbury
"Golden Heir" ...	Mr. A. E. Warr	... W. E. Thurlow	... Mazoe
"Baronet" ...	Mr. J. A. Attwater	... D. M. Syme	... Makwiro
"Meercot" ...	Mr. E. R. Morrison	... H. H. Williams	... Bembezi

SUSSEX.

"St. Valentine" ...	Mr. H. C. Wickham	... G. H. Huckle	... Inyati
"Oakover Shillinglee" ...	Mr. Campbell Newington	J. Strickland	... Penhalonga
"Wadhurst Gold Link" ...	Mr. J. C. Drew	... L. Black	... Salisbury
"Rankins George" ...	Mr. A. J. Butcher	... F. Clayton	... Salisbury
"Linton Corporal" ...	Mr. F. S. W. Cornwallis	... T. M. Rixon	... Insiza
"Linton Captain" ...	Mr. F. S. W. Cornwallis	... E. G. B. Witts	... Mazoe
"Linton Prince" ...	Mr. F. S. W. Cornwallis	... G. Mountford	... Selukwe
"Bully Boy" ...	Mr. Harley Brown	... G. Forrestall	... Chibi
"St. Albans 11th" ...	Colonel Hammond	... R. A. Fletcher	... Bulawayo
"Bonfire King 3rd" ...	Mr. Joseph Godman	... G. Dobbin	... Mazoe
*"Birling Gilchrist" ...	Hon. Ralph Nevill	... R. McIlwaine	... Macheke
"Birling Pelham" ...	Hon. Ralph Nevill	... G. M. Reynolds	... Macheke
"Birling Cecil" ...	Hon. Ralph Nevill	... J. G. Jones	... Insiza
"Birling Percy" ...	Hon. Ralph Nevill	... A. R. Jelliman	... Macheke
"Lynwick Duke 2nd" ...	Mr. J. Aungier	... M. Den	... Salisbury
"Lynwick Duke 3rd" ...	Mr. J. Aungier	... W. E. Thomas	... Plumtree
*"Oakover Royal Preeble" ...	Mr. Campbell Newington	McIlwaine & Taggart	... Macheke
*"St. Albans 10th" ...	Colonel Hammond	... McIlwaine & Taggart	... Macheke

RED-POLLED.

"Majioulini Junior" ...	Mr. H. G. Walne	... W. J. Woods	... Redbank
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* Imported by private purchasers, but shipped and treated with the Government bulls.

The Construction of Dipping Tanks for Cattle.

*(From Notes kindly supplied by the Public Works
Department, Salisbury).*

The following particulars may be regarded as furnishing a model estimate of the specifications of work to be done and materials to be used in the construction of a dipping tank on the lines of the accompanying drawings.

Cement.—The cement to be Portland and of the best quality.

Posts.—The posts for race and yards to be Mopani or Mahobohobo, if procurable; to be not less than 5" in diameter at the small end, stripped of bark and well carbolineumed before fixing. The posts must be dressed quite clean to prevent injury to cattle.

Stone.—Stone for concrete to be the best clean granite or quartz, no stone to be larger than will pass through a 2" ring (any way). If quartz rubble is used it must be thoroughly well washed before mixing.

Water.—Water to be clean and free from organic impurities.

Sand.—Sand to be the best clean sharp granite grit; to be free from loam or vegetable matter and if necessary to be thoroughly well washed before using.

Wire.—Wire to be four barb, two ply with barbs 6" apart.

Rails.—Rails to be deal, clean and free from knots and splints. Native timber may be used for rails wherever procurable, but it must be perfectly straight and quite free from knobs or projections that might cause injury to animals.

Excavation.—Excavate for tank to the dimensions shewn on drawings. No more ground must be taken out than is

actual necessary. Remove all surplus soils and spread where directed. Before commencing to lay concrete the bottom of all excavations must be well watered and well rammed. Well ram all round the walls of Tank as the work proceeds.

Concrete.—The whole of the materials to be accurately measured in boxes or empty cement casks. The concrete to be composed of five parts broken stone, three parts good sharp sand and one of cement, to be turned over twice in a dry state and twice in a wet state, and when laid in place to be thoroughly well rammed. The concrete must be mixed on wooden platform and not on the bare ground. The water must not be thrown on in buckets, but sprinkled on through a fine rose. The two sides and ends of the tank must be completed first, and the floor laid last of all. The concrete must be laid down immediately after mixing. In mixing concrete old material must not be incorporated in the new mixing. All concrete must be laid in boxes made with $1\frac{1}{2}$ " boards, and no layer must exceed twelve inches in height. Every old layer must be well wetted before commencing to lay fresh concrete.

Lay barbed wires in the position shewn on section, to run right round the tank, and all to unite; top, bottom, and side wires.

The surface of floor in race, in draining pen, and bottom of tank must be floated up with one of cement to three of sharp sand, to be well trowled and brought to a smooth fine face. The edge of floor of race, at entrance of tank must be rounded. The surface of slope leading out of tank is to be finished rough, for foothold of cattle, by racking up the surface after ramming. The floor of draining pen must be 4ins. thick at the sides and to slope $\frac{1}{2}$ in. towards the centre. Near the entrance to tank leave a hole in the floor of draining pen to be 3in. in diameter fitted with 3in. outlet pipes. Fit a wooden plug with an iron top and ring. The plug must be left in place when dipping and should be removed during rains to prevent rain water running into the tank. On each side of the race lay a dwarf wall of concrete, to be 4ins. wide to prevent dip washing over the floor of race when cattle enter the tank. The wall will start from ground level and will be 9in. at the end near tank. After completion plaster

the whole of the walls of tank inside and out with one of cement and three of sharp sand, steel trowelled, to be not less than $\frac{1}{2}$ in. thick, walls well wetted before plastering.

All concrete must be kept well watered as the work proceeds, and all walls to be well wetted for a week after completion. The floors of tank, race and draining pen must be covered with wet sand for 14 days after completion. The floors of race and draining pen must be V jointed diagonally from the centre to sides every 18ins., joints $\frac{1}{4}$ in. deep. All concrete must be thoroughly well rammed and kept wet as the work proceeds. The concrete must be laid as quickly as possible and the whole of the materials must be on the ground before commencing to mix. All concrete must be mixed under supervision, and the contractor must give due notice of his intention to lay same before commencing work.

Fencing.—The whole of the posts must be of Mopani or Mohobohobo to be not less than 5ins. diameter at the small end, stripped of bark and well carbolineumed before fixing. The race will be formed of poles or rails as shewn on plan. Posts for yards to be not more than 10ft. from centre to centre, let into ground 18ins. and well rammed. All posts must be 6ft. above the ground and free from knobs or projections. Well spike to posts round the whole of the yards and enclosures, *three or more* $4\frac{1}{2}$ in. x $1\frac{1}{2}$ in. rails, to be the distance apart shewn, all well carbolineumed before fixing.

Fix three 3in. x 3in. slip rails where shewn on plans, to be fixed in strong wire loops well stapled to posts. All posts should be sound and free from heart shakes. Fix rails diagonally across the ends of tank where shewn on plan to prevent animals jumping on to wall of tank.

Quantities of materials required for a tank as above described:—

4 pieces	$1\frac{1}{2}$ " dia.	pipe 6' long	across exit	
1 "	3" dia.	pipe 6' long		} for drawing
1 "	3" dia.	pipe 3' long		
Rails. 6—12	$4\frac{1}{2}$ " x $1\frac{1}{2}$ "			
" 12—14	$4\frac{1}{2}$ " x $1\frac{1}{2}$ "			
" 48—20	$4\frac{1}{2}$ " x $1\frac{1}{2}$ "			

Slip Rails, 6—10, 3 x 3

„ 3—15, 3 x 3

(Native wood may be used in the place
of imported timber).

80 posts, 5in. diameter, 7ft. 6in. long.

30 posts, 5in. diameter, 8ft. long

1½ coils barbed wire

15 gallons carbolineum

50lbs. 5in. spikes

33 casks cement

25 cubic yards broken stone

18 cubic yards sand

16 pieces 16ft. long 9" x 1½" deal } for Race

8 pieces 11ft. long 9" x 1½" deal } close hoarding.

The Cultivation and Preparation of Ginger

Ginger is the underground stem (rhizome) of the plant known botanically as *Zingiber officinale* indigenous to the East Indies, but now cultivated in many tropical countries, such as the West and East Indies, West Africa and Queensland.

CULTIVATION.—Two methods of cultivation are adopted. That by which the best ginger is obtained consists in planting in March or April (in Jamaica) portions of selected rhizomes from the previous year's crop, care being taken that each portion of rhizome planted contains an "eye" (embryo stem). These portions of rhizome are placed a few inches below the surface of the prepared soil and about one foot apart, the process being much the same as that observed in planting potatoes. It is advisable to thoroughly clear the land of weeds before the sowing of the rhizomes is done as otherwise the removal of weeds becomes difficult later on when the ginger plants have developed. Unless the rainfall is good, it is necessary to resort to irrigation as the plants require a good supply of water. The ginger produced in the foregoing way is known as "plant ginger."

"Ratoon ginger" is obtained by leaving in the soil from year to year a portion of a "hand," i.e., roots and a portion of a rhizome containing an "eye." This "eye" develops in the normal way, given rise to a supply of rhizomes in the succeeding season. "Ratoon ginger" is smaller and contains more fibre than "plant ginger," and the product obtained by this means is said to deteriorate steadily from year to year.

The foregoing relates mainly to the cultivation of ginger as followed in Jamaica. The plan adopted in Cochin (India) differs from it but little. In the latter country the land is ploughed two or three times before the rhizomes are planted, and these are usually placed about 9 inches apart in parallel furrows 15 inches apart. The field is then covered over with the leaves of trees or other green manure to keep the soil moist, and over the leaves organic manure is spread to a depth of about half an inch. At the end of the rainy season

it is necessary to resort to irrigation. During the first three months of the dry season, the field is weeded about three times.

COLLECTION AND PREPARATION OF THE RHIZOMES.—“Ratoon ginger” is gathered from March to December, but “planted ginger” is not ready for digging until December or January, and from then until March is the ginger season. The rhizomes are known to be ready for digging when the stalk withers, this taking place shortly after the disappearance of the flowers. The plant flowers in September in Jamaica. The rhizomes are twisted out of the ground with a fork. In performing this operation great care is necessary, as any injury inflicted on the rhizomes depreciates their market value. Considerable experience is necessary in order to lift ginger rhizomes properly.

The “hands” (complete rhizomes and adherent fibrous roots) are piled in heaps, the fibrous roots are broken off, and the soil and dirt removed immediately as otherwise it is difficult to get the finished ginger white. The roots should not be allowed to lie in heaps long as they are liable to ferment. The usual plan is, as soon as the roots and excess of soil have been removed, to throw the ginger into water to be ready for “peeling or scraping.” This is done by means of a special knife consisting merely of a narrow straight blade riveted to a wooden handle. The operation of peeling is a very delicate one, the object being to remove the skin without destroying the cells immediately below it, since these cells contain much of the oil upon which the aroma of the best qualities of ginger depend. As fast as the roots are peeled they are thrown into water, and washed, and the more carefully the washing is done the whiter will be the resulting product. As a rule the peeled “hands” are allowed to remain in water overnight. Some planters in Jamaica add a small proportion of lime juice to the wash water at this stage. After washing, the peeled rhizomes are placed in a “barbecue” which consists merely of a piece of levelled ground covered with cement on which the ginger is placed to dry in the sun. Where a “barbecue” is not available a “mat” consisting of sticks driven into the ground across which are laid boards, palms or banana leaves on which the ginger is exposed until it is dry, is used. Careful planters put their ginger out daily at sunrise and take it in each night at sundown; conducted

in the latter way the operation of drying takes from six to eight days.

The finished ginger is graded according to size and colour of the "hands," the best grades consisting of the large plump "hands" free from traces of mildew and the poorest the shrivelled dark coloured "hands." As a rule the crop is divided into four or five grades. The best hands obtained in Jamaica weigh as much as eight ounces, four ounces being an average weight.

Unpeeled ginger is merely freed from its rootlets and excess of soil and then thoroughly washed in water and finally dried in the sun. Much of the Cochin ginger is placed on the market in an unpeeled condition, but the best grades are peeled in the same fashion as in Jamaica and fetch similar prices in the United Kingdom.

SOIL AND MANURE. Comparatively little attention has been paid to the nature of the soil best suited to ginger cultivation, and to the kind of manure which should be employed to fertilise soils exhausted by ginger crops. In Jamaica the primitive plan of clearing forest lands by fire has been largely followed and on this cleared land ginger is grown until the soil becomes exhausted, when it is abandoned and a new piece of land put into cultivation. This wasteful method has resulted in the production of large tracts of exhausted land which are no longer under cultivation in the Colony, and the reclamation of which is still an unsolved problem. (See Kilmer "Bulletin, Department of Agriculture, Jamaica," 1898, V., p. 241.)

In Cochin, on the other hand, manuring is regularly practised, the manures generally employed being oil-cake or dung. The principal constituents removed from the soil by ginger are stated to be lime, phosphoric acid and soda, and it is the replacement of these constituents which should be aimed at. The soil should be readily permeable by water, as if this collects about the rhizome, the latter is apt to rot. The best varieties of Jamaica Ginger are grown on a sandy loam, and in India the ginger produced on the compact black soils is said to be poorer than that grown on the lighter sandy soils.

(The above memorandum has kindly been supplied by the Director of the Imperial Institute, South Kensington, London.)

The Cowpea (*Vigna Catjang.*)

By R. H. B. DICKSON, Assistant Director of Agriculture,
Mozambique Company, Beira.

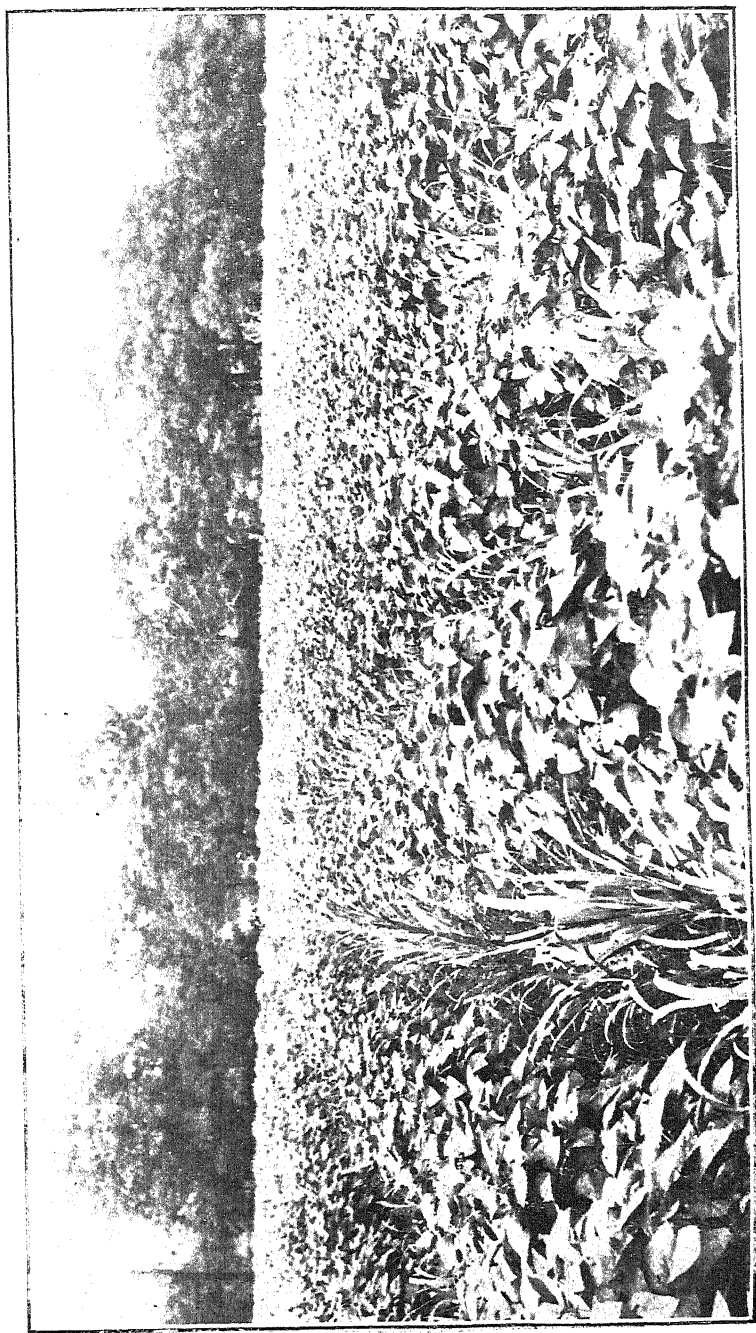
The Cowpea, Kaffir Bean or Asparagus Bean, is a native of Tropical Africa and India, and is universally cultivated throughout the Tropics. It was introduced into the American Continent towards the end of the 17th Century and has now become the most general leguminous crop grown in the Southern States, while in China and India it is also of great value from an Agricultural point of view. Where, however, climate and soil permit of lucern or clover being grown, the cowpea will make little headway. In Southern Rhodesia where the growing of some leguminous crop in rotation with maize will soon become absolutely necessary, the cowpea is probably the best alternative to lucerne, except in specially favoured districts.

Notwithstanding its common name, the cowpea is more nearly related to the bean than to the pea. It is an annual plant varying much in its habit of growth from quite an erect plant to one decidedly trailing. Intermediate types are found, and they depend on soil and climate as well as on variety. Although it appears to climb, it has no tendrils as have all the vetches. The leaves are trifoliate (split into three parts) like the common garden bean; the flowers are white or whitish purple; pods of a straw colour, purple or black, varying from 5 to 10 inches long, and containing many (6 to 12) seeds. These latter vary much in colour, white, pale buff, red, brown, mottled and black.

CLIMATE AND SOIL.—As the cowpea is a native of the tropics, it requires a warm growing season. The yield of grain is decreased however by excessive rainfall. It will succeed on practically all types of soil, provided they are warm and well drained, even on those which are too poor for

cotton or maize production. They are especially valuable for dry sandy soils, and therefore should be useful for the granite soils of this country.

PLANTING.—As with soybeans, cowpeas may be grown for hay or for grain, or for combined seed and hay production. For *hay*, planting may be done broadcast, with a grain drill or with a planter. If sown in rows 24 to 36 inches apart, the seed required is 30 to 45 lbs. per acre, and when sown with a grain drill 76 lbs, while broadcasting requires about one-fourth more seed than drilling. Cowpeas for hay should be planted about the end of January, so that they are fit to cut in May or June after the rains are over. Planting for *grain production* must be thinner than for hay; if planted in rows 24 to 36 ins. apart, 15 to 30 lbs. of seed per acre will be required, if broadcasted 40 to 80 lbs., and if sown with a grain drill 30 to 60 lbs., depending on the size of the seed, the smaller the seed the less weight is required per acre. Planting for grain production should take place earlier than for hay, as more pods are required to mature. Peas planted before the 14th January at Salisbury were fit to pick by the 14th June, and were not injured by the frost. The rows were placed 30 inches apart, and the plants were well podded, and covered the ground between the rows (see accompanying photograph). A very common practice in the Southern States is to sow cowpeas at the last cultivation of the maize crop between the rows, which are generally 4 feet apart. Some of the pods are allowed to ripen, and are gathered by hand, and the rest of the crop is pastured or made into hay. Sometimes maize and cowpeas are grown together and made into ensilage, especially on dairy farms. In the sugar cane districts, three crops of cane are taken off the land, and in the fourth year it is planted to cowpeas or maize and cowpeas. The maize is gathered and the cowpeas grazed off, or fed as hay to the work animals. Cowpeas and soybeans are sometimes sown together for hay, as the latter make the harvesting and curing somewhat easier. One bushel of soys to half a bushel of cowpeas should be used per acre, if broadcasted, or half the amounts if sown in drills. The Mammoth and Hollybrook Soys, and Whippoorwill and Iron Cowpeas are recommended. A dressing of wood ashes as recommended for soja beans would probably be beneficial to the cowpea crop.



Soy Beans planted between sugar cane in Natal.

SOIL IMPROVEMENT.—Very beneficial results follow the use of cowpeas, which like lucerne and other leguminous crops have the power of obtaining nitrogen from the air. Cowpeas grown this season on the Salisbury Experiment Station on new land from imported seed had nodules on the roots. The beneficial results obtained from growing a crop of cowpeas and ploughing in the vines and stubble are here given* :—

Crop.	Ploughing in whole plant after harves- ting pods.	Ploughing in roots and stubble only.
	Increased yield.	Increased yield.
Maize Grain	413 lbs.	241 lbs.
Oat	544 „	496 „
Wheat	339 „	402 „
Kafir Corn Hay	4,200 „	4,160 „

* Alabama Station Bulletin No. 120 (1902).

HARVESTING.—The proper time to cut for hay is when most of the pods are full grown and a considerable number of them are ripe. At this stage none of the best hay varieties have dropped their leaves. The best varieties for hay are those of an upright habit of growth, as the Whippoorwill, Unknown, New Era and Iron. The best method of harvesting is to use the mowing machine. The plants are left in the swath until wilted, and before the leaves become too dry and brittle, they are raked into windrows the same or following day, where they remain one or two days. They may be then put into small cocks or built up round a pole on which pieces are nailed at right angles, or round triangular pyramids. Any device which will allow the air to circulate freely through the cocks is suitable. The hay is ready to stack when moisture cannot be wrung out of the stems by twisting them with considerable force. If grown for grain production the pods are often handpicked, which renders the seed very expensive. Harvesting with a mower fitted with a bunching attachment gives satisfactory results. Before harvesting over half of the pods must be ripe. The vines are then allowed to become thoroughly dry, after which they are threshed.

THRESHING.—Cowpeas may be threshed with an ordinary grain threshing machine, but a low and even cylinder speed must be maintained, 300 to 400 revolutions per minute. Care

must be taken to have sufficient space between the concave and cylinder teeth, so that the peas are not cracked. Small machines run with a 6-h.p. petrol engine for threshing oats, cowpeas, etc., are obtainable in the United States of America for about £120, and hand machines for shelling the peas for about £10.

YIELD.—The yield of seed in America averages about 600 lbs. per acre with a maximum of 2,400 lbs. or 12 bags, while hay production averages $1\frac{1}{2}$ tons up to 5 tons per acre as the maximum yield.

VARIETIES.—There are some 50 varieties of cowpeas, but only a few are cultivated to any extent. They differ in many characteristics, such as shape of pea, habit of growth, time of maturity, colour and size of pods and peas. The variation in habit of plant is largely influenced by soil, climate and time of planting. The use to be made of the crop should determine the variety grown.

For table use, varieties with white or nearly white seeds are preferable, as they have a more marketable appearance. None of them are satisfactory for forage purposes. The chief of these are Blackeye, Lady, and White. These may be considered, perhaps, as vegetables.

For Forage, those of large size, of an upright habit of growth, producing many pods and holding their leaves well, are preferable. The chief are Whippoorwill, Unknown or Wonderful, New Era, Groit, Iron, Clay, Black, Taylor and Red Ripper.

The Whippoorwill is suitable both for hay and grain production. The seed is mottled chocolate on a reddish ground colour. It may be considered the standard cow pea for field purposes. It is one of the larger seeded varieties.

The Unknown, or Wonderful is the largest growing cow-pea, but is late in maturing. The seed is of a very light clay colour, and of large size. It was grown this year at the Salisbury Experimental Station, but owing, no doubt, to the late rains, it suffered badly from mildew, so that it was quite useless for forage.

The New Era is a very erect growing variety. It matures in 75 to 90 days, being one of the earliest cowpeas. It is the

smallest seeded of any cowpea in general use, which has the advantage of needing less seed per acre than any other varieties. The seed is bluish in colour.

The Iron is not so vigorous or large as the *Unknown*. It is earlier however, and the seed is smaller. It is resistant to cowpea wilt disease and the attacks of nematode worms, which do much damage to other varieties when grown in sandy soil. It is vigorous, prolific and erect growing. The seed is hard and retains its vitality longer than other varieties and is less damaged by weevil. This variety and the *Unknown* hold their leaves better than any other varieties. It was grown this year at the Experimental Station, at Salisbury, from seed imported from the United States of America. A photograph of this plot is shown. It matured in about 4 months, and did not suffer from late rains as did the *Unknown*. Some of the pods were over 6 inches long and contained 10 to 11 seeds each. The seed is of nearly the same colour as the *Unknown*. It grows very well in sandy soil.

The Clay varies a good deal in its habit of growth. It is of a pronounced trailing variety. The plants are vigorous but low growing, and seed sparingly. The seed is of the same colour as the *Unknown* and *Iron*.

The Black is useful on sandy soil, where it seeds heavily. It is also used in rotation with sugar cane in Louisiana. The seeds are large and quite black. It drops its leaves earlier than any other variety.

The-Taylor has larger seeds than the other varieties, and they are similar to the *New Era* in colour and markings. It has a trailing habit, and drops its leaves early.

Red Ripper is a valuable variety, as it makes as good a growth as the *Unknown*, but is very late in maturing. The seed is dark red of about the same size as the *Whippoorwill*.

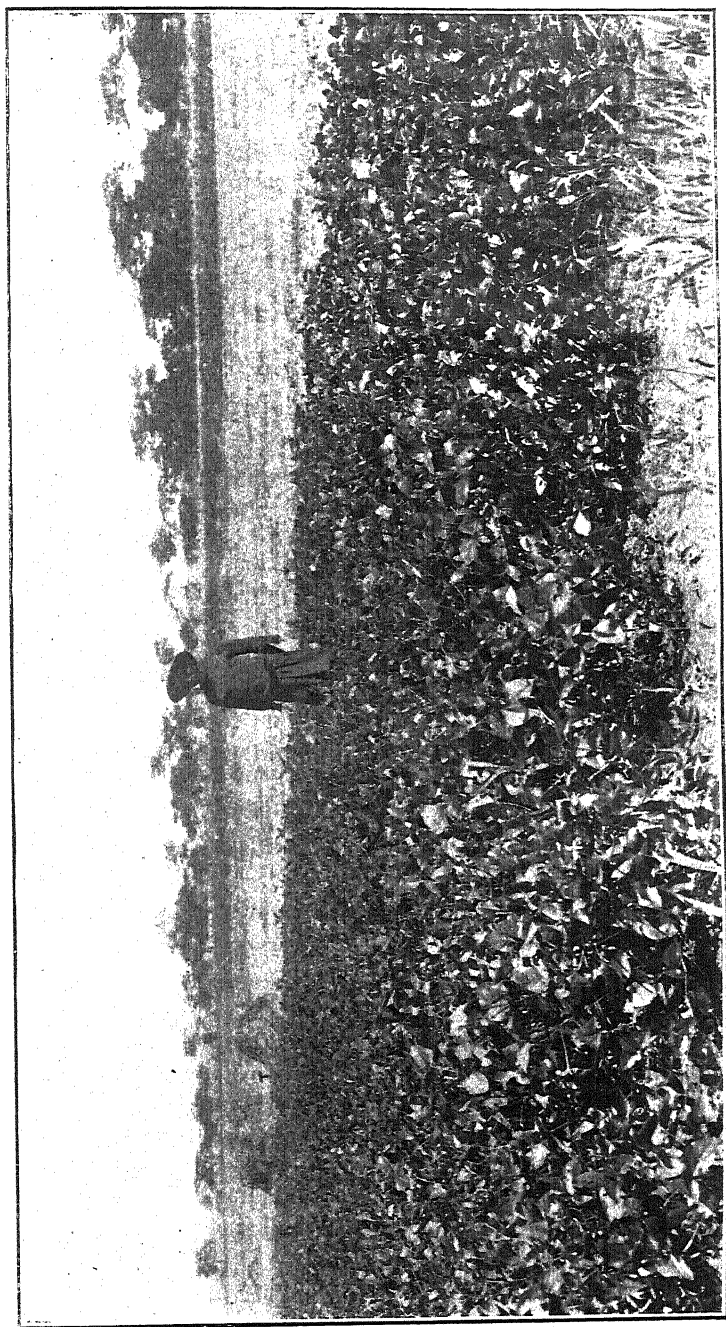
The Groit is somewhat superior to the *New Era* in that it grows larger and produces more grain. The seed is similar to that of the *New Era*, but it has chocolate mottlings in addition to blue specks.

PASTURING AND FEEDING VALUES.—Where there is much scarcity of labour, the cowpea may be pastured instead of

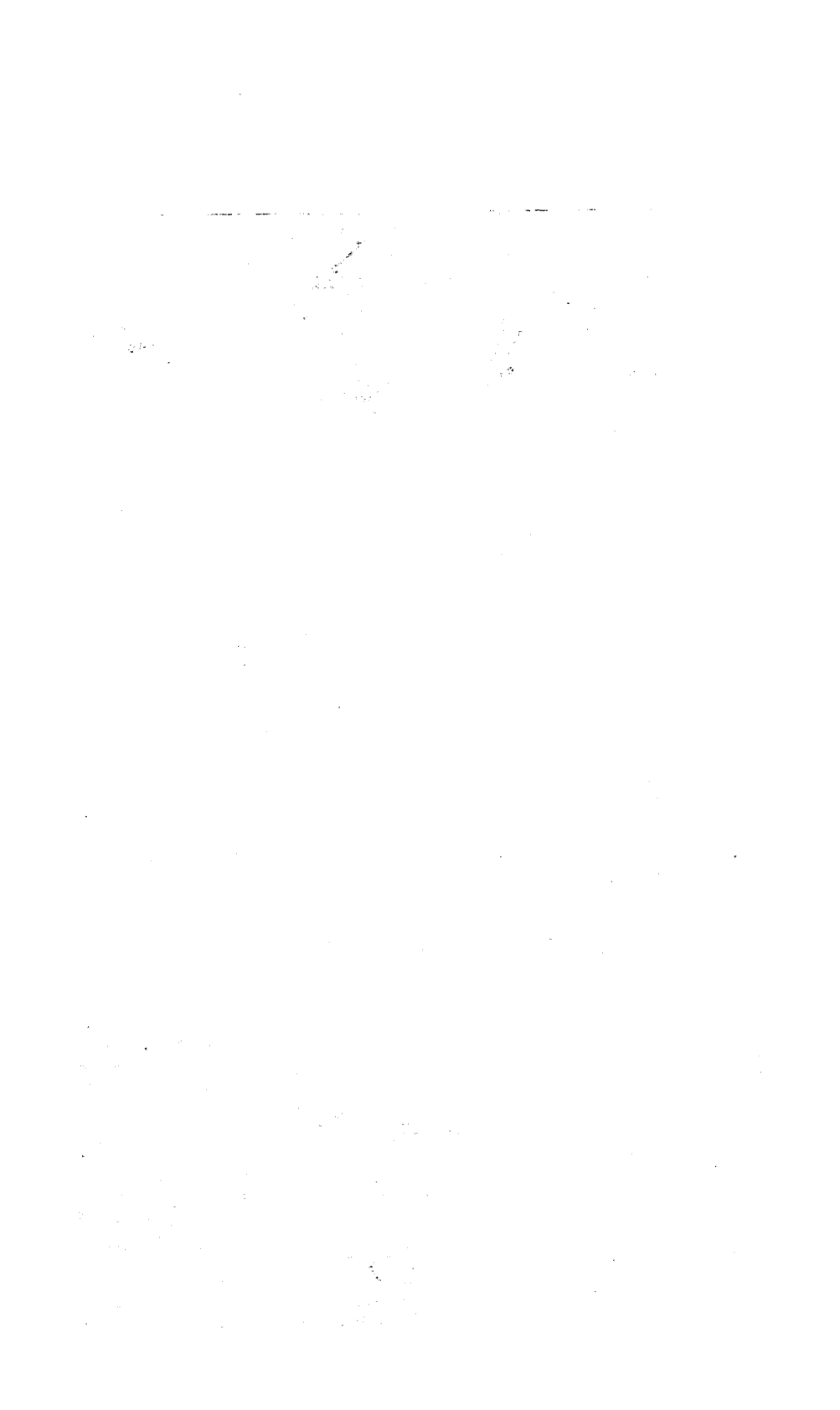
harvested. Cowpeas planted in maize may be fed off by pigs after the maize crop has been harvested. Pigs are turned in when the first pods are ripe or when the amount required for next seasons seed has been gathered. From trials in the Southern States it was found that pigs fed on maize alone gained 0.36 lbs. daily, while those on cowpea pasture and maize gained 0.97 lbs. daily, consuming 36 per cent. less maize for each lb. of gain. It must be remembered that not only was this amount of maize saved, but that owing to the quicker gains the period of fattening was also considerably reduced, and more pigs were got rid of in a given time. The returns per acre of cowpeas worked out at about 44s., reckoning maize at 1s. 8d. per bushel of 56 lbs. and pigs at 1½d. live weight. Whenever a bacon factory is started in this country the cowpea should be of inestimable value to farmers for pasturing pigs in conjunction with feeding maize grain, thus keeping on their own farms a large percentage of the soil fertility which is to-day sold off in the maize crop.

COWPEA HAY,—containing a fair number of ripe peas, is a very valuable foodstuff. It can be used as a maintenance ration for horses, mules and cattle. It is the only roughage used in the sugar cane fields of Louisiana for the working animals, and in hot weather it is a better food than grass hay and maize. It is excellent for producing a good flow of milk, and 3 lbs. of chopped hay is equivalent to 1 lb. of cotton seed meal in the production of milk and butter. The high price paid for cowpea grain prevents its use as a feeding stuff. The seed may be fed with good results to pigs and to poultry, which are very fond of the leaves in the hay. Cowpea straw left after threshing out the peas is an excellent form of roughage.

USES.—The value of cowpeas is greatly enhanced by the numerous uses to which it can be put. Not only does it supply excellent hay, grain and straw for forage, but the pods may be picked green and eaten as are French beans, or the grain may be eaten as flour or split peas. The crop may be pastured by hogs and cattle, or it may be ploughed under for green manure, in both of which cases the soil is improved to a very marked degree. It is useful for growing in alternate rows with the maize crop, when both may be harvested for their grain, or converted into ensilage, or it may be grown in a regular rotation with maize as a hay or grain crop. It may



Iron Cornucopia. Botanical Experiment Station, Salisbury.



also be used as a cover crop in orchards, to prevent the washing away of the soil especially when situated on hill-sides, or to save the expense of continual cultivation and weeding by their action in keeping down grass and weeds.

SOYBEANS AND COWPEAS COMPARED.—Soybeans will not make nearly as good a growth on poor soil as cowpeas. They withstand a greater amount of moisture and also frost than cowpeas, and they are more drought resistant. While cowpeas continue to grow until killed by frost, soybeans reach a definite size and mature. The soy is easier to harvest, as it grows erect or nearly so, while the cowpea is more inclined to spread, and therefore more difficult to harvest. For green manuring the cowpea is more valuable. The value of the hay of the two plants is about the same. For growing with maize or Kaffir corn for hay or silage, the cowpea is generally preferred to the soybean. The value of an acre of soybeans for feeding beef cattle is about 50% greater than that of an acre of cowpeas, and the yield of soybeans is about so much greater. For grain production the soybean is preferable to the cowpea, as it produces a richer grain and is easier to harvest. Soybean hay has practically the same feeding value as lucerne.

Report on Export of Rhodesian Maize, etc.

BY MESSRS. FEAR, COLEBROOK & CO., LTD.

The maize received through the British South Africa Company, especially that Rhodesian grown, has given general satisfaction. The Flat White, such as Hickory King and Salisbury White, which has come through as the *best quality*, has made an excellent price, and has been well approved by the buyers. It has been almost entirely sold for manufacturing purposes, some for corn flour; and some for manufactures, used in brewing.

White Flat Maize from South Africa generally seems likely to hold its place in the market, and at the time of writing, the price still holds good; but it should be well borne in mind by growers that the prices have been exceptionally high, from varying causes. This last season there was a very considerable failure in the Argentine crop. The United States, although they had a good crop, were short on the previous one, and have had comparatively little for export; while the crop in Europe was by no means large, and had to account a good deal for the deficiency in the Argentine. It is difficult to foresee, but it is most improbable that prices will hold for any length of time at present figures. On the other hand, it would appear unlikely that we shall return for some time to the low level prevailing a few years back.

When the writer was in Rhodesia, he urged the growers should in part try the smaller varieties of yellow round maize, of which there is such a large consumption in the United Kingdom and the continent. He feels bound to qualify this view to some extent, as apparently there is no likelihood of such large shipments of White Flat Maize from the South African Colonies, as would place it below the level of Yellow Round Maize, and until the shipments increase considerably, it must answer the purpose of growers to continue with the variety which has been proved to crop well, and to command a good price.

Rhodesia has escaped the condemnation which has been passed on some of the maize from the other Colonies. In some instances, from the South, maize has been shipped in too green a state, and has arrived in bad condition, which has led to serious grumbling. One is only too glad to say that if the shipments from Rhodesia are still carefully watched, they will establish a reputation which will be very useful to the growers, not only in *good*, but even more so in *weaker* markets. The bags have carried well, and there has been little loss in shipment, in fact, the outturns have been generally satisfactory. There is no objection to sending some maize which would not, perhaps, come right up to standard, always provided it is well notified beforehand ; and in many cases it will make quite good prices.

The increase in freight which has taken place since the first rates were established, is rather trying, especially with produce which is only just beginning to find a market in the United Kingdom and the Continent. It is to be hoped that a return to the original rate of freight, which was quite as much as the average rate from the *Argentine*, will yet be made.

LINSEED.—We have carefully examined the samples of Linseed received from Rhodesia, and the quality is quite well liked. When the writer was in the country, it was considered that Linseed was rather too forcing, and took too much out of the land, to be worth cultivating to any large extent. I believe this view has become somewhat modified, and at any rate, it is well to bear in mind that Linseed has been a very lucrative crop for some years past, the prices having ranged high.

Barley : From a Maltster's Point of View.

Contributed by the SOUTH AFRICAN BREWERIES, LTD.

Tradition states that barley was the first cereal cultivated, and it has been clearly proved that as far back as the time of Moses beer made from barley-malt was the national drink of the Egyptians. It is strange, but none the less a fact, that all through the ages barley has been grown and converted into malt, yet the chemist until recently has been of very little assistance to the maltster in determining the malting value of barley, and the old conditions of valuation by hand and eye examination still continued to hold sway. In these days, however, great changes are taking place in the old and long established industries of barley growing and malt-making, and it is a source of satisfaction to see the growth of a broad toleration which has led to practical men recognising the value of their scientific leaders, and still more important, to the acceptance by scientific men of the principle that practice cannot be disregarded by scientists without grave disadvantage.

A grain of barley contains, in addition to the germ, or embryo, a large store of material in the shape of starch, etc., which is there for the purpose of supplying nourishment to the young plant before it has thrown out its first green leaves, and becomes capable of maintaining an independent existence. All that is required to set in action the vital machinery of the barley corn is the presence of water in sufficient amount, a suitable temperature and a free supply of oxygen. When the barley is planted in the soil it finds there all the conditions for changing its dormant state into one of active vitality. The maltster imitates these conditions artificially. He supplies the requisite water by soaking the barley in cisterns, afterwards keeping the grain at a suitable temperature on the malting floors, and securing a supply of air by frequently turning it. After a certain amount of change has taken place the maltster puts an end to further vital action, and completes the process by drying the grain upon a kiln at varying degrees of

temperature. The object of the maltster is to convert the barley starch into a soluble variety of starch, as it exists in malt, and to transform the walls of the cells which contain starch in the barley corn. What is termed the diastase in the embryo or blade converts the modified starch into sugar when treated with hot water by the brewer. The maltster requires as much starch as possible in each individual kernel of barley, so as to be able to pass on to the brewer the greatest amount of modified starch, and the brewer in turn converts this into sugar. It is an acknowledged fact that manures high in phosphates tend to increase the amount of starch in the barley corn, whereas manures rich in nitrogen have an unfavourable tendency. It has been said, by a well-known authority on the subject, that the four essentials of barley needed to make a superfine or first-class malt are: vitality, good condition, maturity, and good odour; and the desirable non-essentials are—size, shape, weight, uniformity, colour and appearance of skin. It may be unhesitatingly stated that malt can stand the most severe test if the barley from which it is produced is perfect in the first four essentials.

The most important question the grower who wishes to produce first-class barley has to determine is the methods he can adopt of manuring in such a fashion that he can secure the heaviest yield of grain which is not too nitrogenous for the brewer's needs, and as there are prospects of an increasing demand for first-grade barley, it is essential the grower should make quality the primary consideration, and yield the secondary consideration, for a lesser yield of prime quality will undoubtedly give the grower a greater return than a large yield of inferior quality barley. Chevalier or two-rowed barley is eminently adapted for cultivation in heavy and nitrogenous soils, and in soils enriched by heavy manuring, as the nitrogen content of Chevalier is not sensibly raised by a higher rate of nitrogenous manure. In emphasizing the necessity for careful manurial treatment, it is necessary to point out that although Chevalier and closely allied types of barley are undoubtedly more resistant to the influence of nitrogenous soil it should be recognised that even with these barleys the over-use of nitrogenous fertilisers is conducive to coarseness in barley crop, and a corresponding lowering of malting quality, with an increased ratio of nitrogen to starch content, when

expressed on an average series of corns. It is never desirable with heavy soils to force the crop by use of nitrogenous manures. When dealing with natural manures it is most essential, if regularity of crops is to be assured, that care should be taken in arriving at uniform distribution over the whole field. For light sandy soils found in warm countries like South Africa, the Smyrna of six-rowed barley would seem to be the best, but it is also necessary that the proper attention should be given to manuring.

The best results are usually obtained from early sown barley, and it is advisable that nothing but prime barley, well screened, and of good germinative capacity, be used for this purpose. The quality and purity of type of seed barley are factors of supreme importance in influencing the uniform germinative activity of the grain, and enhancing considerably the malting value of the barley crop. Successful experiments have been made in the use of kiln-dried barley for seed purposes, the result being to give greater uniformity and to promote the growth of the crop.

Barley should be dead-ripe before being cut. Remember that the malster in laying down this principle is merely following that process of nature, which ensures that a seed shall be dead-ripe ere it is cast to the ground to germinate and go through the cycle of growth again. Taking nature as our guide we must be careful to avoid premature cutting if the germinative activity of the barley is to be of the highest degree. Here may we emphasise that the greatest care is needed during threshing operations to ensure that none of the barley shall be bruised or damaged. Whenever these damaged corns get into the malthouse, mould and bacteria develop, and difficulties of a serious nature arise, both to the malster and brewer. The matter is of greater importance than is usually realised, and if growers could guard against such injury at time of threshing they would be conferring valuable assistance upon those whose business is to manufacture the barley into a high grade standard of malt. The care and attention given by the growers in the various stages, from the seeding to the threshing, and the delivery of the barley to the malster, will be amply repaid to them by the increased prices obtained.

Notes from the Agricultural Laboratories.

BOTANICAL.

NAPIER'S FODDER (*Pennisetum Benthami*, Steud).—In Vol. vii., No. 5, June 1910, of this Journal, I drew attention to a perennial Fodder Plant which it was proposed to name Napier's Fodder. During the last eighteen months this plant has been cultivated on the Botanical Experiment Station, Salisbury, in comparative trials with Uba Sugar Cane. The grass was established by means of cuttings, and produced flower heads during the second season. Specimens were forwarded to the Director, Royal Botanic Gardens, Kew, England, by whose courtesy Napier's Fodder has been identified botanically as *Pennisetum Benthami*, Steud.

Napier's Fodder, or Zinyamunga or Marambamunga as it is known amongst the Rhodesian natives, is indigenous to tropical Africa, and though previous reports have commented on its frost and drought resistant properties, these characteristics have not been well marked during the past season. The winter of 1911 was unusually severe, but whereas Uba Sugar Cane on the Experiment Station remained more or less green throughout, and was never entirely dormant in growth, Napier's Fodder was seriously cut by frost, and made no new growth until the month of October.

While Napier's Fodder reached a height of eight to ten feet with hard woody stems, sugar cane only grew from three to five feet in height, but nevertheless produced a much more luxuriant leaf growth and a more succulent stem.

The following interesting feeding analysis of Napier's Fodder and Uba Sugar Cane when grown under similar conditions has been prepared by Mr. Blackshaw, the Agricultural Chemist:

Composition of Sugar Cane Fodder (*Saccharum officinarum*) and Zinyamunga Fodder or Napier's Fodder (*Pennisetum Benthami*, Steud), grown on the Botanical Experiment Station, Salisbury:—

Particulars of planting, etc.

	Time Planted	Sample of Analysis.		
		Collected	Length of Stalk in ft.	Length of Leaf in ft.
Sugar Cane ...	Jan. 1910	July, 1911	2	3
Zinyamunga ...	Mar. „	do	8	2

The fodder had not been cut down since planting.

<i>Analysis.</i>				Sugar Cane Fodder c/ %	Zinyamunga Fodder c/ %
Water ...	...	...	...	73'63	61'81
Ether Extract ...	...	...	...	0'22	0'29
Protein (Nitrogen x 6'25) ...	...	...	...	1'27	2'92
Carbohydrates ...	...	...	...	17'73	17'29
Woody Fibre ...	...	...	...	5'32	14'77
Ash ...	...	...	...	1'83	2'92

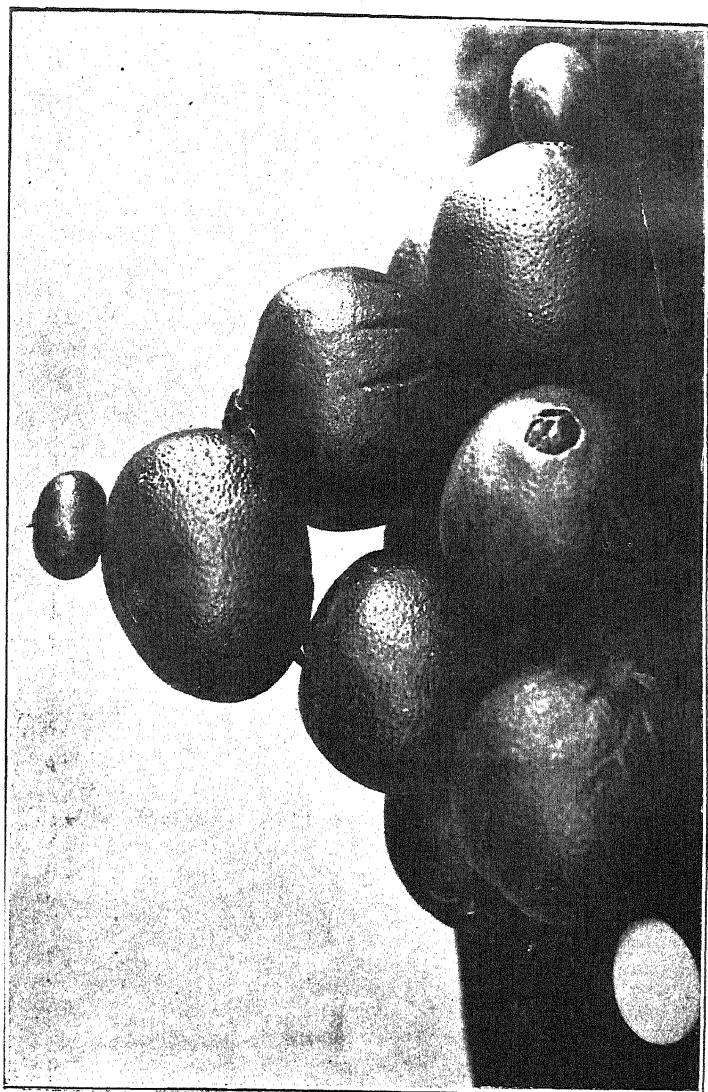
“The amount of juice expressed from stripped stalks by passage between the steel rollers of an ordinary flattening mill used for rolling out metals was in each case as follows:—

Juice expressed {	Sugar Cane Stalks 56'6%		Zinyamunga Stalks 21'3%
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The juice of Zinyamunga was tasteless and of low sugar content, whilst that of sugar cane was sweet and contained 6'69% Sucrose (cane sugar) and 2'84% Glucose.

The points to be noted in comparing the two fodders are:—

- (1) That Zinyamunga contains a much higher proportion of Woody Fibre.



*Washington Navel Oranges, grown by Mr. R. W. Cockerell, Matikas, Umtali.
On the left a large hen's egg and on the top a large nardije. Weight of the two top
oranges, 2 lbs. each. Circumference 16 inches.*

- (2) *That in the middle of the dry season (July) the stalks of sugar-cane are much more succulent.*
- (3) That sugar cane fodder is more palatable."

In considering this analysis it must be borne in mind that the particular stalk of suar cane was somewhat younger than that of Napiers fodder. On the latter in July there was very little young growth while the sugar cane was in all stages of growth from new shoots of a few inches in length to stems five feet in height.

The results of these trials appear to indicate that on soils of moderate fertility and moisture contents Uba sugar cane is a more valuable fodder than Zinyamunga but on poor dry soils similar to those of the kafir gardens, Napiers fodder would probably be the better. Owing to its habit of producing tall coarse stems Napiers fodder should be cut or grazed repeatedly and should not be permitted to mature its growth. Sugar cane on the other hand, as it grows in this territory, can be permitted to reach its full growth before being cut and can then be used for silage or for feeding green to stabled animals.

H.G.M.

Poultry Notes.

By H. FRANKLIN.

REARING.

Besides comfortable quarters, chickens, to thrive, must have exercise, clean water, grit, shade and attention, together with a variety of grains, green stuff and meat foods.

Exercise is as essential as food; the natural way for a chick to get its food is to scratch for it, taking a little at a time.

If chicks cannot be out of doors the floor of their run should be covered with loose earth, over which should be thrown some litter, such as chaff or leaves. In this small quantities of grain should be scattered as often as convenient, and the chickens will then be compelled to scratch about to obtain it. The object is always to have the birds hungry enough to hunt for food, and always a little food for them to find.

If chickens are kept in a run and fed from a trough or grain scattered on the bare ground they often become weak and suffer from bowel trouble, and it is generally concluded the food is wrong. As a matter of fact they are invariably weak from want of exercise.

Plenty of clean water should always be accessible, placed in shallow dishes, out of the sun.

Grit is essential to the health of chickens, it forms in effect their teeth, and is required for the proper mastication of food in the gizzard. Limestone, old mortar, all kinds of rock and broken crockery will make grit, and the harder and sharper the better.

Grain is the principal, and too often the only food of the chicken. The common way of feeding grain is to mix meal and water and feed in a trough or on the ground. If the feed is placed in a heap the weaker chicks are crowded out. The meal is rapidly eaten and without exercise, when wet feed is

thrown on the ground or in a dirty trough chicks pick up adhering filth, and if food is left over it rapidly sours and becomes a menace to the health of the chickens. The best method to give all food, or a large part of it, is in a dry or semi-dry condition.

MEAT FOOD.—Chickens are not by nature vegetarians, they require casein or meat to thrive. Chickens with an allowance of casein make much better growth than chickens with a purely vegetable diet.

Insects are generally relied upon to supply the deficiency. This would be well if they were plentiful all the year round, but fresh cut bone is an excellent source of providing the meal and mineral matter needed by growing chicks. The best way is to feed in a hopper and let the chickens keep themselves. If the chicks are at liberty feeding is not so important. A feed of grain morning and evening is all that is necessary. Grass fields, or land under crops, where chickens can forage to their heart's content, have a plentiful supply of small insect life, such as ants, worms, beetles and grubs of various kinds which the exceptionally keen sight of the chick is quick to observe. Such natural foods, together with the succulent young shoots of herbage have a beneficial effect on poultry of all ages and influences their vigour and development in a most satisfactory manner.

During the hot summer months every attention must be given or poultry will assuredly suffer. Shade is an essential and if chickens cannot take shelter from the sun, they will cease to grow and contract many ailments. Shade is particularly necessary when the feathers are growing, *i.e.*, from six to eight weeks, when your stock are often half naked. Branches of trees, grass or sacking may be easily arranged, where no natural shelter is afforded, as a protection from the sun's rays. During their growing period pure birds often need assistance in feather growing, and it will be found that a little flowers of sulphur dusted in the soft food in the morning will assist, while in the dry food a small quantity of linseed or crushed sunflower seeds may be added to their ordinary rations. Green food should be given *ad lib* to chickens, especially lettuce which if chopped finely, will be readily eaten.

Ventilation is of great importance in sleeping quarters and if reared in an open fronted house, young stock become early acclimatised and are not so prone to succumb to changes of temperature as when reared in a house screened on all four sides.

Cleanliness must be ensured in all houses, not only cleaning out daily but whitewashing at intervals with a disinfectant added, or spraying with paraffin are great helps in preventing the ravages of insects. Fleas are an intolerable source of loss among chicks, sucking the blood which reduces the vigour and checks growth. It is common to find the eyes, comb, ear lobes a mass of black, clinging fleas. The easiest method of killing these is to smear vaseline over the affected parts.

Reviews.

MILK TESTING.—To all cattle farmers the quality of their milk is important, if they intend making butter or disposing of their cream to a creamery.

The want of handbooks of practical assistance to farmers in grading up their herds, has always been felt, but "Milk Testing," by C. M. Walker Tisdale, F.C.S., N.D.D., although written for the old country, treats all details in so thorough a manner and is so sound and eminently practical in analytical methods, that it will be appreciated by busy Rhodesian farmers and dairymen, who would give neither the time nor the trouble to wade through volumes of deeply scientific theories.

This is. book teaches how to *quickly and accurately* test milk with reliable results.

Starting with the composition of milk, 87.55 of water, 3.60 of butter fat and 8.85 of solid non-fats, it explains that fat globules vary in size in the ratio of 1-6, Frieslands and Ayrshires yielding the smallest, and Jerseys the largest globules.

Newly calved cows butter is soft because of the excess of soluble fatty acids in the milk at that time. "Olein" is the acid in butter fat, formed by the green food of the cow in Summer, and it is the increase of this acid which makes summer butter softer.

Dry winter foods tend to slightly increase "Stearin," an acid soluble at 130 but the decrease of "Olein" makes the butter firmer.

The breed of a cow, and also her individuality, affect the proportion of the two parts of fat which are further affected by variations of food.

The author next explains various methods of testing for purity and cleanliness, and the use and failure of the Lactometer to detect adulterated milk.

The advantages of the Creamometer make interesting

reading when it comes to deal with the large size fat globules of the Jersey cow.

The chapters on various tests of milk and separated milk are especially suitable for Municipal control of milk supply, and for cream for Co-operative Creameries.

The reasons are stated for proportionate sampling of morning and evening milk (which vary at 3.4 to 4.3 per cent. of fat), and the necessity to take from top, bottom and middle of milk cans and to mix.

The necessity for knowing the richness of each cow's milk, at once strikes all intelligent farmers who have decided that butter making or the supply of cream to a creamery is to form part of the *income*, and the book will be found to be full of useful and practical hints and information.

The use and harm of preservatives and colouring are fully dealt with, and the temperature for efficient Pasteurisation is given as either 2 minutes at 185 degrees Fahrenheit, or half-an-hour at 140, not less in either case, emphasising that the heating must not be carried out in a covered vessel, as contact with the air is necessary to destroy Tubercle Bacilis.

"BUTTER-MAKING ON THE FARM AND IN THE CREAMERY," by the same author, in collaboration with Mr. T. R. Robinson, is an excellent guide to the dairy industry, and is published at 98, Fetter Lane, E.C.

E. F. SHEPPY.

REPORT OF THE SPECIAL MAIZE AND CITRUS SHOW AND CONGRESS.—Through the courtesy of the Union Department of Agriculture, we have been placed in possession of a considerable number of copies of this report which is edited by Mr. J. Burt Davy, F. L. S., Agrostologist and Botanist (Transvaal).

From the maize growers point of view this report may be said to be one of the most interesting bulletins yet published in South Africa and we have no hesitation in recommending it to the notice of every Rhodesian farmer. The whole of the report is devoted to maize growing, exhibiting and marketing, and among a series of fifteen articles the following of more particular interest are included: Maize growing in the Transvaal, by W. A. McLaren; Maize in Rhodesia,

by G. M. Odum; Production of Maize in the Province of the Free State, by E. J. Macmillan; Manurial Experiments with Maize, by H. J. Vipord; Studies in Agriculture by E. R. Sawyer; and Report on Maize Exhibits, by J. Burt Davy. The problem of grading and shipping maize for export is also dealt with by Mr. W. W. Hoy and by Captain John Rainnie, Port Captain, Durban.

To the would-be breeder of pedigree seed maize, the contributions dealing with the relative merits of different exhibits will be of special value as indicating the type of ear which experience has proved is most profitable to produce. Each year the demand for good seed maize increases, and yet in Rhodesia the number of farmers who make any systematic effort to supply this demand is lamentably small.

Mr. Odum makes a good point in his paper when he states "that we have long since concluded that increased yield is a matter of strain rather than variety." The number of types of maize grown in South Africa to-day is legion and the sooner these are reduced to an absolute minimum the better it will be for the country, particularly where export is concerned. There are not a few who contend that by breeding and selection sub-types suitable to different districts and localities could be produced without greatly departing from one South African standard. There is no doubt that the presence of a large number of different types adds to the difficulty of grading and in the interests of the good name of South African maize, should be avoided as far as is consistent with the requirements of local conditions.

Copies of the Report of the Maize Congress are available for issue and will be forwarded free of charge by the Editor of the RHODESIA AGRICULTURAL JOURNAL to any *bona fide* farmer resident in Southern Rhodesia.

H.G.M.

"THE SOUTH AFRICAN BEE-KEEPERS' JOURNAL."—The South African Bee-keepers' Association request us to draw attention to the fact that a journal devoted entirely to the interests of bee-keepers in South Africa is about to be published. At present all publications dealing with this interesting and remunerative industry are published in the Northern Hemisphere, and owing to differences in climate, seasons

and general conditions, are not of such value to South African bee-keepers as they otherwise would be.

Now that importation of oversea honey has been prohibited apiculture in South Africa is becoming of increasing importance, and a journal published in the sub-continent, and contributed to by bee-keepers of wide South African experience is already assured of hearty support. Southern Rhodesia is well endowed by nature with veld flowers and flowering trees and shrubs, and even the native is a bee-keeper in his modest way.

"The South African Bee-keepers' Journal," the first copy of which appeared on the 1st November, 1911, should do much to stimulate interest in a branch of farming which might profitably receive greater attention. The journal is published by the South African Bee-keepers' Association, P.O. Box 3658, Johannesburg.

H.G.M

FARMERS' HANDBOOK.—The report of the proceedings of the Eighth Annual Congress of the Rhodesian Agricultural Union, held at Umtali, June 1911, has recently been published in booklet form, and reflects the greatest credit on all concerned in its production. The printing is excellent, and throughout the volume are a series of illustrations representative of the scenery and farming activities of Southern Rhodesia. The Rhodesian Agricultural Union has the satisfaction this year of finding itself in a sound financial position, and the excellent manner in which this report is presented is a further sign of progress, coupled with improvement.

"HOARD'S DAIRYMAN."—We have received from Messrs. W. D. Hoard & Sons, Port Atkinson, Wisconsin, U.S.A., a copy of their paper entitled, "Hoard's Dairyman," together with the information that they will be glad to supply a specimen copy to any correspondent who will apply for the same. This publication is eminently practical and contains a considerable amount of useful information. We would advise those of our readers interested in dairying to take advantage of Messrs. Hoard's offer.

The Swedish Chamber of Commerce in London has forwarded to this Department a special Colonial Hardware, Dairy Machinery and Agricultural Implement issue of that Chamber's Journal, together with the advice that, until the issue is exhausted, copies will be sent free by post to any applicant. The Journal contains interesting articles on Sweden's share in the Development of Dairy Farming, Agricultural Machinery and Implement Testing Stations in Sweden, and also several contributions dealing with mechanical milking machines, dairy utensils, etc.

H.G.M.

Agricultural Reports

FOR OCTOBER AND NOVEMBER, 1911.

Ploughing and preparation of arable land has been in full swing both among European farmers and in the native reserves. Owing to scarcity of spring rains considerable difficulty has been experienced in bringing red land to a good tilth and for a similar reason maize planting is likely to be unduly late. With the exception of a few localities where heavy thunderstorms have occurred practically no rain worth considering had fallen up to the 20th November, by which date in a normal season many farmers would be well on with their planting. The heat also has been exceptional and on formation areas the veld is very backward, the little growth that had been made being burnt off by the heat of the sun. As a consequence stock in some districts have suffered in condition but general health has remained good.

The demand for selected seed maize has been more apparent than last season, the need for increased returns per acre apparently making itself felt. The growing of reliable seed receives far too little attention and many farmers desirous of purchasing good seed are compelled to content themselves with inferior stuff owing to lack of supplies. The farmer with but a moderate acreage of land suitable for maize might add considerable to his income by setting himself to produce good selected seed for which a market is always forthcoming. Seed maize commands from three to four times the current consuming price and a good margin of profit remains to the breeder.

Small seeds, such as Boer Manna, have been extremely scarce, and large quantities have been imported from other parts of South Africa. Prices have ruled as high as 7d.—9d. per pound for this seed, and the growing of manna seed is another side line which some farmers might well give attention to. Similarly, seed oats true to name and of good quality are always hard to obtain, not to say expensive, and with the utilisation of vleis soils for this crop there is no reason why farmers too remote from the railway to grow oat

forage, should not attempt the growing of seed oats. Rhodesia has reached a stage of agricultural development when the demand for reliable seed is widely apparent, and it is high time the constant importation of the common farm seeds, which can be produced in the country, ceased.

Owing to late frosts, early planted potato crops were much hindered in growth, and new potatoes have commanded exceptionally good prices.

The growing popularity of *Paspalum* grass is well evidenced by the increased importation of this seed by local seed merchants, and the good demand for it which exists.

Native grain still shows a tendency towards shortage, but more amongst individuals than generally. For this reason the natives are trading amongst themselves, and but little native grain is reaching the market. In Matabeleland the increased use of the plough by natives in the cultivation of their lands is reported, and we hear of one case where a Chief has two white men in his employ.

Tobacco seed beds are for the most part looking well, but in some districts a caterpillar has made its appearance and done considerable damage to the young plants. The matter is receiving the attention of the Government Entomologist.

Cuttings from the Press.

CATTLE.

HEREFORD.—Notable as were our host's sheep, his Hereford cattle were even more striking. Herefords always look very uniform, but we had never seen anything to match his herd, where all the cows might be own sisters, so close were they to type. After the Shorthorn the Herefords have travelled the most widely of all cattle, and this they owe to their power of ranging and putting up with rough conditions, which causes them in many places to be preferred to the Shorthorn, though the latter undoubtedly yield meat of finer quality and grow more rapidly on the better classes of land. The Herefords are probably descended from the old race of red cattle which are supposed to have come in with the Saxons—the Devons, the Sussex, and the Lincoln Reds being other offshoots of the same primitive stock. Some features in the shape point to this common origin, while the characteristic white face and the very massive head are known to have been bred in at no very distant date. Like the Sussex and the Devon they are exclusively beef cattle; some of their supporters claim that they can be made to milk freely, but under ordinary management the dams always suckle their calves, and it is well known that only the greater strain of milking will develop the udder to the extent required of a true dairy cow. Our host's animals were all bred with entire white faces, the red ring round the eye, which a few years ago was demanded by the foreign buyers because it was supposed to render stock less liable to ophthalmia in hot countries, being no longer in fashion.—*The Times*. London.

ABERDEEN-ANGUS.—The Aberdeen-Angus breed has scored a notable victory at the Fat Stock Show at Palermo, Buenos Aires. The championship was won by a bullock of the Scottish breed, which in the sale ring realized £170, and the best group of three animals was secured by this and other two sisters from the same herd. It is expected by supporters of the Scottish breed that this triumph will do much to pro-

mote its popularity in South America, where the Shorthorn and Hereford have already established strong positions.—*The Times*, London.

THE DEVELOPMENT OF CATTLE INSURANCE IN GERMANY.
—Cattle insurance was known and practised in Germany in the 18th century, and is at the present time most widely diffused in this country.

The economic importance of this branch of insurance consists in the fact that it not only supplies the farmer for whom his cattle represents perhaps his only resource, with an immediate compensation in the case of the decease or death of an animal, but also stimulates the prevention of disease and therefore the general hygienic condition of the cattle.

In fact, as will be seen in an article on this subject published in the July number of the *Bulletin of Economic and Social Intelligence* of the International Institute of Agriculture, the persons insured are obliged to take care of their cattle, to call in a veterinary surgeon without delay if one of them falls ill, and to do everything possible to prevent infectious diseases from spreading.

As the health of the cattle depends to a large extent on the care and diligence of the owner, the form of organisation which prevails absolutely is the mutual aid society, in which all those insured are interested in the satisfactory working of the undertaking, thus facilitating the control of risks and the repression of fraud.

In 1909 there were 28 large mutual aid societies and 7 individual undertakings, the cattle insured with the big societies represented a capital of about 586,000,000 marks, the value of that insured with the individual undertakings, being about 117,000,000 marks.

The premiums paid during the same year amounted to 12,105,094 marks, the sum of 12,953,099 marks being paid out in compensation for the disease or death of animals.

In addition to these big mutual aid societies and the individual undertakings, there are thousands of small local mutual aid societies in Germany which deal in this insurance; the management expenses of these societies are minimum, and

the farmer therefore frequently prefers to deal with them, the premiums being much lower.

In spite of this fact, however, the progress of the large mutual aid societies is undoubted, as will be obvious from a perusal of the above-mentioned article; and as their operations are extending over a wider expanse of territory, they are able to give better compensation and also to face more serious disasters. They frequently insure against the risk, by means of a special clause, of the sanitary authorities refusing to permit the public to consume the meat of the animals slaughtered.

In 1910, in consequence of the Imperial law of May 30th, 1908, on the insurance contract, all the societies had to modify their policy conditions. Under the new conditions, it is established amongst other things that no compensation will be given for animals which have died in consequence of the owner's neglect or bad treatment, that animals cannot be slaughtered, except in case of urgency, without the consent of the society with which they are insured, etc.

In 1909 five mutual aid societies in Germany extended their operations to foreign territory, namely, to Luxemburg, Norway, Sweden, Switzerland, Belgium, Denmark and Austria. The sum total of the amounts insured abroad was 3,266,833 marks in 1909, showing a considerable increase on the business done in the previous year, which is another proof of the good organisation of the private German insurance societies.—*International Institute of Agriculture Bureau of Economic and Social Intelligence.*

PIGS.

FATTENING PIGS.—An experiment on the feeding of pigs on maize and other foods has been carried out at the University at Nebraska, and the result of that trial is embodied in a bulletin which has recently been received by us. The experiments were conducted with lots of poor pigs, fed as follows :—

- (1). Maize meal.
- (2). Maize meal, 7 per cent., and wheat shorts, 25 per cent.
- (3). Maize meal, 90 per cent., and slops, 10 per cent.

(4). Maize meal, 90 per cent., and steamed ground bone, 10 per cent.

The pigs were taken from the pasture into a piggery with cemented floors. It would appear that the grain consumed per pig was almost the same in every case in the first year over the seventeen weeks, during which the experiment lasted.

Lot 1 consumed 5.47 lb. daily per pig.

Lot 2 consumed 5.58 lb. daily per pig.

Lot 3 consumed 5.59 lb. daily per pig.

Lot 4 consumed 5.49 lb. daily per pig.

The relative costs in the case of Lot 1 per 100 lb. of grain, taking the dollar at 4s., were 18s. 8d.; 17s. 9d. in the case of lot 2; 17s. 2d. in the case of lot 3; and 18s. 6d. in the case of lot 4.

The actual amount of grain in lbs. to make 100 lb. live weight in a pig was 583 lb. in the case of lot 1; 550 lb. in the case of lot 2; 507 lb. in the case of lot 3; and 581 lb. in the case of lot 4.

The gain daily in the case of lot 1 was .95 lb.; lot 2, 1 lb.; lot 3, 1.10 lb.; and lot 4, 1.15 lb.

These experiments were carried on through another season, for a period of twelve weeks in the one case, and ten weeks in the other. The only difference is that the pigs that had maize only, cost less to make 100 lb. gain than those which were fed on maize, plus shorts, or slops, or ground bone. An additional one pen was tried, in which the pigs had skim milk at the rate of 3 lb. of skim milk to 1 lb. of maize.

The average daily gain per pig in this lot was much heavier than in any other, but apparently the cost of making a pound of gain, on account of the milk used, was also heavier than in any other.

Thus, to make a 100 lb. gain, live weight, the difference was almost a dollar, or 4s., which seems to lead to the conclusion in the latter experiment that the increase of live weight in pigs is most cheaply attained by feeding maize only. But we have to look more to quality than actual weight; and in the market the maize-fed pigs would make a poor show against pigs which had been fed on more flesh-forming foods than mealies,—*Times of Natal*.

HOUSING OF PIGS.—There is no animal on the farm which requires better protection from the cold than the hog; none for which a good bed is more necessary; and none so much in need of sunshine as the little pig. The horse and the cow have good coats of hair—even a calf or a colt when left in the cold is provided with a good fur coat; the hen's feathers are the best of protection against cold; but the hog has almost nothing between his skin and the weather. One of the first requisites for success with hogs is a shelter where young pigs can be kept warm and well supplied with sunshine and fresh air. A little pig takes cold very easily and recovers slowly, if at all. To prevent taking cold he must be kept dry, warm, away from draughts, and provided with fresh air. Without a good house two litters a year cannot be raised to advantage, because the spring pigs must be put off until so late that the fall litters do not get well started before cold weather; but with a good house two litters can well be raised.

Unpublished data collected by the writer show that good hog men average about seven pigs raised to the litter, and many surpass this record. The same data indicate that the general average raised on the farm does not exceed four pigs to the litter. The wide difference is very largely due to the housing. Many houses which cost enough to be good are thoroughly unfit for the purpose because the sun cannot shine into the pens. Nearly every large hog house is deficient in either sunshine or ventilation, or in both. A little pig loves sunshine, and needs it almost as much as he needs food. No piggery is fit for the purpose unless it admits direct sunshine on to the floor of every pen at the time the pigs are farrowed, furnishes plenty of fresh air, and provides for exercise in the open air. Dryness, sunshine, warmth, fresh air, freedom from draughts, and exercise are of primary importance in raising pigs; not one can be neglected.—“Farmers' Bulletin,” U.S.A. Department of Agriculture.—*Times of Natal*.

CO-OPERATION.

THE EXAMPLE OF DENMARK.—The September number of the Journal of the Board of Agriculture contains an interesting

account of the growth of the co-operative movement in Denmark, based upon a report drawn up for the Foreign Office, by Mr. R. Turner, late Vice-Consul at Copenhagen. Until the latter half of the last century Denmark was a corn-producing country, but about forty years ago this branch of agriculture ceased to be profitable, and it was then that the Danish farmers took up dairy farming. This departure has been attended by so much success, that Denmark is now ranked as second in the list of European countries according to wealth per head of the population. The system of co-operation may be said to be an adaption of the English Rochdale system. The first step was the foundation of a co-operative supply stores which was followed in 1882 by the first co-operative dairy, and the movement had developed to such an extent that there is not a single matter of interest to the farmer that has not become the object of co-operation. This remarkable progress is stated to be due to the small holdings system, which itself would have been impossible without co-operation. Beneficial legislation has enabled a large proportion of the agricultural population to own the land they work. There are to-day about 2,117 large estates, 75,320 peasant farms of from 20 to 150 acres, and 68,000 small holdings, varying from three to seven acres. Apart from the direct benefit to the farming classes, the policy pursued by the State has checked emigration and increased the rural population. Of the prosperity of the peasant farmers and small holders there can be no doubt, but it must not be forgotten that the Danish peasant is a very hard-working man, his way of life is cheap, he enjoys and profits by educational opportunities which do not yet exist in many countries, and he derives every possible assistance from the Government.—*Rhodesian Herald*.

Article.	Johannesburg	Kimberley.	Bulawayo.	Salisbury.
Barley, per 150 lbs. ...	9/0 11/4	9/0 12/6	—	30/0 32/6
Beans, per 203 lbs. ...	19/0 26/6	5/6 5/9	—	—
Beans, Sugar ...	20/0 32/6	24/6 30/6	—	—
Beans, kafir, per 203 lbs.	17/0 18/0	20/0 26/0	30/0 31/6	25/0 27/6
Boer Meal, unsifted, per 200 lbs. ...	—	21/6 22/6	42/0 43/0	40/0 42/6
Boer Meal, sifted, per 200 lbs. ...	17/0 21/0	23/0 24/0	42/0 43/0	42/6 45/0
Bran, per 100 lbs. ...	6/3 6/9	6/3 6/9	10/6 12/0	15/6 16/6
Flour ...	—	—	—	—
Flour, Colonial 100 lbs.	—	14/0 15/0	22/0 22/6	20/0 24/0
Forage, T'vaal, 100 lbs.	—	5 - 5/6	—	—
" Colonial "	—	4/6 5/0	—	—
" Oat	4/9	—	10/6 12/0	—
Hay, per ton ...	—	—	60/0 65/0	9/0 10/0
Kafir Corn, White, per 200 lbs. ...	14/0 14/6	15/6 17/6	16/0 17/0	60/0 65/0
Manna, per 100 lbs. ...	—	—	—	11/0 11/6
				7/6 8/0

Article.	Johannesb'rg		Kimberley.		Bulawayo.		Salisbury.	
Mealies, S.A., White per 200 lbs. ...	8 9	11 0	8 6	11 0	16 0	16 6	12 0	12 6
Mealies, S.A., Yellow, per 200 lbs. ...	9 9	11 0	12 6	13 0	13 6	14 6	—	—
Mealie Meal, White, per 200 lbs. ...	—	—	12 6	13 0	—	—	—	—
Manga, per 200 lbs. ...	—	—	—	—	—	—	14 6	15 0
Monkey Nuts, per lb. ...	—	—	—	—	3 1/4d.	3 1/2d.	—	—
Oats, per 150 lbs. ...	8 0	9 10	10 6	11 3	20 0	21 6	22 6	25 0
Onions, per 120 lbs. ...	6 0	11 0	7 0	10 0	20 0	21 6	20 0	21 0
Peas, per 200 lbs. ...	14 0	14 9	—	—	—	—	—	—
Potatoes, per 150 lbs. ...	7 0	21 0	7 6	12 6	17 6	27 6	20 0	22 6
New ...	10 0	12 0	10 0	16 0	—	—	—	—
Rapoko ...	—	—	—	—	—	—	22 6	25 0
Rye, per 200 lbs. ...	13 0	14 11	—	—	—	—	—	—
Salt, per 200 lbs. ...	—	—	3 0	4 0	10 6	11 6	15 0	16 0
Tobacco, good, per lb ...	2d.	7d.	4d.	7d.	—	—	—	—
" inferior, per lb ...	—	—	1d.	2d.	—	—	—	—
Wheat, per bag 203 lbs. ...	13 0	18 0	18 6	19 6	—	—	27 6	30 0
Butter, per lb. ...	1 0	1 2	10d.	1 0	1 3	1 9	—	2 0
Butter, second quality ...	9d.	1 3	7d.	9d.	—	—	—	—
Eggs, per doz. ...	1 8	2 0	8d.	1 0	1 6	2 6	2 6	3 6
Ducks, each ...	2 0	3 6	2 6	3 3	3 0	3 6	—	4 6
Fowls, each ...	2 0	3 9	2 0	3 3	1 9	3 0	—	4 6
Geese, each ...	4 0	4 10	—	—	—	—	12 6	15 0
Turkeys, each ...	10 6	18 6	6 0	15 0	12 0	25 0	—	£1

LIVESTOCK.

Horses ...	£12	£25	£10	£25	£20	£35	£25	£30
Mules ...	£12	£25	£18	£25	£31	£37 10	—	£30
Donkeys, geldings ...	£6	£8	£5	£7	£7 0	£8 10	£6	£7
" mares ...	—	—	£6	£7 10	£8	£10	—	—
Cows, Dairy ...	—	—	—	—	£25	£35	£25	£30
Cows, Native ...	—	—	—	—	£7	£9	£10	£12
Heifers, Colonial ...	—	—	—	—	£8	£17 10	—	—
Heifers, Native ...	—	—	—	—	—	—	£5	£6 10
Oxen, Trained ...	—	—	£7 10	£8 10	£8 10	£11 10	—	£10
Oxen, Ordinary ...	—	—	—	—	—	—	£8	£9
Cows, Slaughter ...	£6	£14	£7	£8 5	—	—	—	—
Oxen, good ...	£10	£13	£10 10	£13 10	—	—	—	—
Oxen, medium ...	—	—	£8	£9 10	—	—	£8	£10
Calves, ...	—	—	£2	£3	—	—	—	—
Sheep, ...	10 6	22 0	13 0	15 0	15 0	17 6	—	£1
Lambs, 30 lbs. ...	7 6	10 6	9 0	11 0	—	—	—	—
Hamels ...	—	—	13 0	15 0	—	—	—	—
Pigs, clean, per lb. ...	3d.	3 1/2d.	3d.	3 1/2d.	—	—	4d.	4 1/2d.

Veterinary Report September and October, 1911.

SALISBURY.

AFRICAN COAST FEVER.—No cases have occurred.

MAKONI AND INYANGA.

AFRICAN COAST FEVER.—The remaining herd of native cattle was destroyed. Eleven head of cattle were allowed to stray into infected veld and were destroyed. No cases of disease occurred.

BULAWAYO.

AFRICAN COAST FEVER.—1. Woolendale Outbreak.—The remaining herd was passed through a temperature camp, and placed on clean veld.

2 Bulawayo Commonage.—The regular three-day dipping of all cattle on the Commonage has been continued, and followed by a marked decrease in the number of deaths, only 7 animals dying in October, compared to 14 in September, and 36 in August.

3 Bembesi.—On September 20th an outbreak occurred on Mr. H. T. Fynn's farm, in all 10 animals died or were destroyed in a herd of 400 cattle, fortunately a dipping tank had been erected on the farm by the owner enabling the three-days dipping of all stock to be practised, this has been done with the result that only three further deaths occurred early in October.

BLACK QUARTER.—No further cases have occurred and the fencing of Innesfallen farm, Insiza has been completed.

GLANDERS.—The following animals were tested on arrival into this territory with Mallein, and, with one exception,

which has been detained for a further test, were found healthy :—

Horses	...	..	179
Mules	...	...	320
Donkeys	...	...	252

GWELO, VICTORIA AND NDANGA.

RABIES.—Outbreaks were reported in these districts; the application of the Rabies Regulations has succeeded in checking and stamping out the disease to a great extent, but the disease is appearing in a very virulent form, and its extension over a large area is feared.

No cases of contagious diseases have been reported in other districts.

C. R. EDMONDS,
Acting Chief Veterinary Surgeon.

Salisbury,
Rhodesia.

Weather Bureau.

TEMPERATURES.

STATION.	SEPTEMBER.		OCTOBER.	
	Max.	Min.	Max.	Min.
MASHONALAND—				
Chicongas Location	84°2	49°4	88°5	59°10
Chishawasha	79°90	46°40	85°30	54°10
Giant Mine	82°70	53°70	...	...
Hallingbury	83°30	47°00	89°50	59°10
Inyanga (York Farm)	73°20	46°00	77°40	51°80
Melsetter	71°40	...	75°80	...
Melsetter (Mount Selinda)	74°90	55°50	...	...
Salisbury Gaol	78°10	47°60	84°00	57°00
" Laboratory	78°40	47°10	83°50	54°70
Shamva ... ..	...	...	87°00	63°20
Sinoia	88°00	45°10	89°80	54°00
" Summer Field" (Umtali)	86°30	46°00	89°80	55°40
Umtali	75°50	50°70	...	...
MATABELELAND—				
Bulawayo (Observatory)	78°80	50°10	85°60	59°00
Empandeni	81°90	50°10	90°00	61°10
Gwelo	78°60	46°40	85°20	57°20
Rhodes Matopo Park	77°10	48°30	84°90	58°60
Plumtree	78°70	53°30	86°90	61°40
Victoria Falls	88°00	47°60	96°20	60°30

RAINFALL.

STATION.	Sept.	Oct.
MASHONALAND—		
Aodgowan	Nil	0°64
Banket Junction	Nil	...
Charter (Meikle's Farm)	Nil	0°95
Charter (Range)	Nil	2°56
Chicongas Location	0°06	0°20
Chilimanzi ... ..	...	1°47
Chishawasha	Nil	0°41
Darwin	Nil	Nil
Driefontein	Nil	2°40
" Eagle's Nest" ... ..	...	0°12
Eldorado (Railway Station)	0°03	0°12
Enkeldoorn	Nil	0°36
Gadzema (Giant Mine)	Nil	2°57
Gatooma	Nil	2°32
	Nil	2°48

RAINFALL—continued.

STATION.	Sept.	Oct.
MASHONALAND—(Continued)		
Gatooma (Railway Station)	Nil	2'34
Goromonzi	Nil	0'18
"Grootfontein" (Umvuma)	Nil	2'83
Gutu ... ..	...	1'27
"Hallingbury" (Hartley)	Nil	2'77
Hartley, Railway Station	Nil	1'06
Helvetia (Melsetter)	0'24	1'22
Inyanga (York Farm)... ..	0'76	0'45
Inyanga (Police Camp) ... ..	...	1'55
Lone Cow Estate (Lomagundi)	Nil	0 21
Macheke (Railway Station)	Nil	0'24
Makwiro	Nil	0'44
Marah Ranche ... ..	...	1'81
Marandellas (Railway Station)	Nil	0'30
Marandellas (Land Settlement Farm)	Nil	Nil
Marandellas (Good Hope)	Nil	1'06
"Meadows" (Salisbury District)	Nil	0'55
Melsetter	1'11	1'47
Monte Cassino (Makoni District)	Nil	...
Morgenster	0'35	4'55
Mrewa	Nil	1'39
M'toko	Nil	0'50
Mount Silinda	0'75	...
Rusapi Railway Station	0'15	Nil
Salisbury	Gaol	Nil
	Laboratory	Nil
	Public Gardens	Nil
	Railway Station	Nil
	Rhodesville	Nil
Shamva	Nil	Nil
Sinoia	Nil	0'17
Slenish (Mazoe District) ... ..	...	0'30
"Stoneygate" (Hartley District) ... ..	...	0'36
"Summerville" (Umtali District)	0'33	1'06
Teigu ... ..	...	0 20
"Tom's Hope" (N. Melsetter)	0'17	2'10
"Tweedjan" (Marandellas)	0'23	0'08
Umtali	2'22	1'33
Umtali Railway Station	0'32	0'57
Umtali (Mutambara Mission)	Nil	0'05
Umvuma Railway Station	Nil	...
"Utopia," Umtali District	0'32	0'82
"Vermont," Melsetter District	0'62	1'98
MATABELELAND—		
Balla Balla	Nil	1'20
Battlefields Railway Station ... ..	...	2'05
Bembezi (Railway Station)	Nil	0'80
Bulawayo	Government House	Nil
	Observatory	Nil
	Raylton	Nil
Empandeni	Nil	0'75
Fig Tree	Nil	0'45

RAINFALL—*continued.*

STATION.	Sept.	Oct.
MATABELELAND—(Continued)		
Filabusi	0'02	0'64
Globe and Phoenix	Nil	0'84
Gwaai Railway Station	Nil	1'66
Gwanda Railway Station	Nil	1'25
Gwelo	Nil	0'54
Gwelo (Railway Station	Nil	Nil
Heaney Railway Station (Lower	Nil	0'27
Imbeza Kraal	Nil	0'59
Insiza Railway Station	Nil	0'47
Inyati	Nil	0'33
Malindi	Nil	...
Mangwe Pass	Nil	0'20
Marula	0'01	0'11
Matopo Mission	Nil	0'31
Matopo Park	Nil	3'17
Maxim Hill	Nil	0'45
Mazunga ... ..	...	0'61
Mtshabzi Mission ... ..	...	0'74
Nyamandhlovu	Nil	...
Plumtree	Nil	0'10
Que Que	Nil	0'52
Rhodesdale Estate	Nil	0'96
Rixon	Nil	0'55
Selukwe (Railway Station)	Nil	0'62
"Shawlands" (Gwelo)	Nil	1'26
Solusi	Nil	0'57
Syringa	Nil	0'35
Tegwari ... ..	...	1'23
Tuli	Nil	0'59
Victoria Falls (Railway Station	Nil	0'51
Wankie (Police Camp	Nil	Nil
West Nicholson Railway Station (Hospital	Nil	0'48
West Nicholson Railway Station (Railway Station	Nil	0'15
West Nicholson Railway Station	Nil	0'08

Dates of Meetings of Farmers' Associations, Southern Rhodesia. (SUBJECT TO ALTERATION).

Name of Association.	Place of Meeting.	Secretary.	1911.											
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Rhod. Landowners & Farmers	Bulawayo	Harry Hopkins	27	24	31	28	26	30	28	25	29	27	24	20
Midlands	Gwelo	M. L. Price	14	11	11	8	13	10	8	12	9	14	11	9
Mashonaland	Salisbury	W. H. Williamson	14	14	4	4	1	3	1	5	2	7	4	2
Manica	Umtali	P. B. Snashall	14	11	4	1	6	3	1	5	2	7	4	2
Hartley	Hartley	H. F. Savory	14	11	11	8	13	10	8	12	9	14	11	9
Mazoe	Mazoe	V. W. Fynn	21	...	5	...	20	4	22	...	23	...	25	3
Lomagundi	Sinoia	P. W. Kidwell	...	...	25	...	...	...	...	...	...	...	...	...
Marandellas	Marandellas	C. M. Wright	28	25	25	29	27	24	29	26	30	28	25	30
*Central	Umvuma and Enkel- doorn alternately	Rev. A. J. Liebenberg	7	4	4	1	6	3	1	5	2	7	4	2
North Umtali	Summerfield and Nakasaba Mission	R. H. O. Blurten	...	15	...	10	...	21	...	16	...	18	...	20
Victoria	Victoria	T. Rutherford	...	...	...	...	...	...	...	...	...	...	...	...
Victoria (Eastern)	Good Hope Farm	F. A. Readman	7	4	4	1	6	3	1	5	2	7	4	2
*Macheke	Macheke	G. F. Kidson	...	...	...	...	...	...	...	...	...	...	...	...
*Melsetter	Melsetter	D. M. Stanley	...	...	...	...	...	...	...	...	...	...	...	...
Gazaland	Lower Melsetter	J. W. Scott	5	2	...	6	...	1	6	3	...	5	...	7
Plumtree	Plumtree	I. Reid-Rowland	...	...	...	6	...	...	...	...	...	5	...	...
†Figtree	Figtree	A. Curtis	...	...	...	6	...	...	...	...	...	5	...	7
Makoni	Rusapi	R. A. Lapham	7	4	...	1	6	3	1	5	2	7	4	2
Matopo	Matopos	W. E. Dowsett	...	...	5	...	...	4	...	...	3	...	...	3
Makwiro and Norton	Makwiro	F. R. McLellan	...	...	9	...	...	8	...	...	14	7	...	14
Kimberley Reefs	Kimberley Reefs	G. O. Smith	...	5	...	2	...	4	...	6	...	1	...	3
Somabula and Shangani Flats	Somabula	S. Annandale	7	4	4	1	6	3	1	5	2	7	4	2
Headlands	Headlands	H. Barnes Pope	...	25	...	...	27	29	29	30	30	28	25	30
Marula	Marula Siding	MacW. Ingram	28	25	25	29	27	24	29	26	30	28	25	30
Umvuvuvu	T. Membarra Mission	N. N. Rutherford	...	...	4	...	1	3	...	1	...	7	...	2
Insiza	Insiza Station & Peggy Store alternately.	W. B. Harris	7	...	...	...	...	...	...	...	...	...	...	...
†Enteprise	Enteprise	Jas. Watson	...	...	...	...	...	...	...	...	...	...	...	...
Gatooma	Gatooma	Col. Leonard, President	...	...	...	...	...	...	...	...	...	14	11	9
†Upper M'gezi	Upper M'gezi	W. Krienke	...	...	...	...	...	...	...	...	...	...	...	...

† Dates not Supplied.

* Date Uncertain.

Garden Calendar.

By N. L. KAYE-EDDIE.

THE FLOWER GARDEN.

January.—This month requires all one's energy in the flower garden. Annuals may still be sown for late flowering before the season is over. Planting out should be done as early as the weather permits and advantage taken of a dull day after a shower for this work. If care be exercised much smaller plants may be put out than would at first be thought advisable, as with attention these will make stronger plants than larger ones which are more likely to receive a check. The soil requires constant stirring, owing to the packing caused by the rains and for the eradication of weeds, which are now very troublesome. All plants should be kept free of dead and decaying matter.

February.—During this month the flower garden is gradually approaching perfection, and nearly all plants are in bloom. If these are constantly plucked the yield will be increased, and, except where required for seed, all flowers should be removed as they fade, for seeding shortens the life of many plants. All runners and creepers should have constant attention, and be tied up and trained. Dahlias in more exposed positions should be carefully tied to their stakes, as they now become top heavy with the weight of their blooms. Palms in the house and conservatory will benefit much if occasionally put out in the rain.

VEGETABLE GARDEN.

January.—Turnips, carrots, cabbage, lettuce, etc., may be sown for carrying on during the winter months. Potatoes may be planted this month for keeping through the winter. Weeding and cultivating between the rows should be continually carried on.

February.—Potatoes should receive attention and be carefully ridged up and care be taken that the stalks are not buried. Seeds for winter crops should be sown, such as beet, Brussels sprouts, cabbage, carrots, beans, peas, onions, turnips, tomatoes, etc. Vegetables planted out during this month might be placed a little closer together than usual, as watering may have to be resorted to before they mature.

Departmental Notices.

LECTURES FOR FARMERS.

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable, lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner but the suggestion of other themes is invited.

Agriculture.—Maize growing; Maize selection and maintenance of the breeding plot; Points of maize and maize judging, with demonstrations; Utilisation of granite vlei soils; Ground nut culture; Rotation crops for home use and for sale; Veld improvement by winter grasses; Production of foodstuffs for the mines; Ensilage; Fungoid diseases of maize and wheat; Wheat, oats, and lucerne under irrigation; The prospects of cotton culture in Southern Rhodesia.

Veterinary Hygiene.—Detection and prevention of disease; The care of livestock.

Livestock.—Judging of cattle according to breeds, and for beef, milk, and draught; feeding and kraaling of live stock; hints on the principle of cattle breeding.

Chemistry.—The principles of soil fertility; the principles of manuring; the value of lime in agriculture; chemistry of milk and its products (accompanied by demonstrations in milk testing).

Entomology.—Economic entomology on the farm; the role of insects and their allies in the transmission of disease; scale insects and fruit trees and methods for their control; insect pests and maize; enemies of the potato, insect and fungus; the value and objects of plant import and nursery regulations.

Irrigation.—Methods of applying water to land for irrigation ; the measurement of water in connection with irrigation ; canal irrigation ; storage reservoirs ; hints on the selection of sites and on the design of earthen and other dams ; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, soils, crops, processes and kindred matters, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without any indication of where they are from, or why they were sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding speci-

mens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particular regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

CO-OPERATIVE EXPERIMENTS.

The below-mentioned seed will be available from October to January next for free distribution in small quantities under the terms of co-operative experiments to any bona-fide farmer in Southern Rhodesia. Seed is supplied f.o.r. Salisbury, on experimenters undertaking to forward a faithful report on the result of the experiments at the close of the season, on forms which will be supplied for that purpose. Supplies of seed are limited, and not more than five different kinds can be sent to one applicant.

All applications to be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury.

Leguminous Crops.—Lucerne, Egyptian clover, Soya beans, velvet beans, cowpeas, vetches, and lupines.

Summer Cereals.—Victoria wheat, Durum wheat, Bobs' rust-proof wheat, Gluyas wheat, dryland rice, Boer manna, Japanese millet, and Californian green moha.

Winter Pasture Plants and Grasses.—Sheep's burnet, cocksfoot, tall fescue, awnless brome grass, cowgrass clover,

perennial red clover, sheep's parsley, paspalum, and phalaris bulbosa slips and seed.

Oil and Fibre Crops.—Ground-nuts, castor oil, linseed and cotton.

Root Crops.—Mangels, carrots, sugar beet, swedes, kohlrabi, and chicory.

Miscellaneous.—Saltbush, rape, sunflower, mustard, Teff grass, Rhodes grass, and silvery Ramie.

DESTRUCTION OF WILD CARNIVORA, ETC.

It is hereby notified for public information that rewards for the destruction of wild carnivora, etc., will be paid on the scale and conditions herein set forth.

2. Rewards will be paid as follows:—

For each lion	£5	0	0
For each leopard	1	0	0
For each cheetah	1	0	0
For each hyæna	0	10	0
For each wild dog	0	10	0
For each crocodile not less than 3 feet in length	0	10	0
For each baboon	0	2	6

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, of the district, within three months of the date upon which the animal is killed, on a solemn declaration on the prescribed form hereunto annexed.

4. In proof of destruction, applicants for rewards will be required to produce and surrender in the case of a leopard or cheetah the skin with the tail unsevered, and in the case of a hyæna, crocodile, wild dog or baboon the unskinned head. In the case of a lion to produce the skin and skull, the skull only to be surrendered.

5. The skins and heads surrendered for rewards shall become the property of the Government and shall be disposed of in such manner as may be decided on.

FORM OF DECLARATION.

I,.....do solemnly and sincerely declare that I did on the.....day of, and not before, shoot, trap, or poison (as the case may be)..... (describe the vermin for which the reward is claimed) in the district of.....within the boundaries of Southern Rhodesia, and that I am entitled to the reward offered by the Government.

And I make this solemn declaration conscientiously believing the same to be true.

.....
Signature.

Signed and declared at.....
this.....day of.....

Before me,

.....
Magistrate or Justice of the Peace.

CHEMICAL ANALYSIS OF AGRICULTURAL PRODUCTS.

Arrangements have been made for the chemical examination of soils, limestones; grain, and other produce; oil-seeds, cream, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest,

SERVICES OF AGRICULTURAL ENGINEER.

It is hereby notified for public information that the services of Mr. W. M. Watt, Agricultural Engineer, are available to the public for the following purposes. Assistance may be obtained by farmers :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

LOANS FOR FENCING PURPOSES.

The B.S.A. Company is prepared to advance funds to any owner of a farm beneficially occupied by a white person, to provide fencing material, on the following conditions:

1. The full cost of the material at nearest station or siding will be advanced.
2. Payment shall be made in ten equal annual instalments, or less if the applicant desires, together with interest at 5 per cent. per annum, payable in July, but no repayment will be called for within one year of granting the loan.
3. The applicant will be required to furnish personal security to the satisfaction of the Fencing Loans Committee, or to pass a first mortgage bond over his farm as security for the loan.
4. The loan applies both to fences erected on the boundary of properties, and to internal fencing.

The loan will be made on completion of fence, and subject to inspection by a representative of the company.

The fence may be erected to any pattern approved by the Committee, but for guidance the following minimum requirements will normally be insisted upon:—

Straining posts not further than 440 yards apart; standards not further than 45 feet apart; droppers or lacing not further than four yards apart; if no droppers are used standards should not be more than 20 feet apart. If wooden strainers, standards or droppers are proposed to be used, the kind is to be specified.

Applications stating the situation and mileage, and furnishing specifications of fence proposed to be erected, and accompanied by firm and detailed quotations for the material required and cost at nearest station, must be addressed in the first instance to the Director of Agriculture, Salisbury.

Preference will be given to farmers in areas which have adopted Part I. of the "Fencing Ordinance, 1904," but all applications will be considered.

Farmers are invited to submit applications for the consideration of the Fencing Loans Committee to the Director of Agriculture, Salisbury.

SALE OF PASPALUM PLANTS.

Roots of this valuable winter pasture grass, suitable both for moist and dry situations, will be available for sale from December onwards at the rate of 5s. per 1,000 slips f.o.r. Salisbury. A root can be broken up into from thirty to fifty or more slips and, when ordering, the number of slips required should be stated. Applications, accompanied by remittance, to be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury.

FORESTRY.—SALE OF SEEDLING TREES.

It is anticipated that the undermentioned seedling trees will be available for sale from December onwards. The trees are grown on the Experiment Station, Salisbury, and will be sold at a price of 1d. each or 8s. 4d. per 100 f.o.r. Salisbury. With the exception of *Dalbergia sisso*, which is sufficiently hardy to be transplanted direct from the seed beds, the trees will be grown in tins and will be placed on rail in this condition. If required to be sent by Agricultural parcels post, they will necessarily have to be removed from the tins, but this method of forwarding is not recommended.

Orders must be accompanied by cheque or post office order for the necessary amount, and the Department is unable to reserve trees unless payment has been received. When it is desired that the trees be despatched to a Siding the amount of railage should also be remitted. Orders should be received at least seven days before the date on which despatch is desired, and after delivery of trees to the Railway Company, the Department can accept no further liability. Since Stocks are limited, application should be made early, and should be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury.

<i>Eucalyptus citriodora</i>	...	Lemon scented gum
<i>Eucalyptus ficifolia</i>	...	Red flowering gum
„ <i>polyanthema</i>	...	Red box gum
„ <i>rostrata</i>	...	Rostrata (Red) gum

<i>Eucalyptus saligna</i>	...	Saligna gum
„ <i>robusta</i>	...	Swamp mahogany
„ <i>globulus</i>	...	Blue gum
„ <i>patentinervis</i>	...	
<i>Pinus canariensis</i>	...	Canary pine
„ <i>halepensis</i>	...	Aleppo pine
„ <i>insignis</i>	...	Monterey pine
<i>Robinia pseudacacia</i>	...	Locust acacia

HEDGE PLANTS.

<i>Abergia caffra</i>	...	Kei apple
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DIPPING TANKS.—GRANTS IN AID.

The Government is prepared to assist farmers in the construction of private dipping tanks by a grant in aid on the £ for £ principle, but not to exceed, however, a total sum of £50.

This grant will only be paid to approved applicants, and after the tank has been inspected by an official appointed for this purpose and found suitable, and on production of receipted accounts in support of their claim.

Farmers wishing to take advantage of this grant should apply to the Director of Agriculture, from whom full particulars can be obtained, together with plans and specifications of a suitable tank.

SERVICES OF TOBACCO EXPERT.

Farmers wishing to avail themselves of the services of the above should apply to the Director of Agriculture, giving particulars of the nature of advice required, also the distance and direction of their farms from some well known centre.

DEPARTMENTAL BULLETINS.

The following Bulletins on special subjects, consisting mainly of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia:—

AGRICULTURE.

The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., LL.B.

- The Conservation of Kraal Manure, by H. Godfrey Mundy, F.L.S.
- Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S.
- Requirements in sending Botanical Specimens to the Department for Identification.
- The Use of Lime in Agriculture, by G. N. Blackshaw, B.Sc., F.C.S.
- Agricultural Co-operation in Rhodesia, by P. J. Hannon.
- Plans and Specifications of Flue Curing Barns.
- Report of Forestry in Southern Rhodesia, by J. Sims, F.H.A.S.
- Hints on Irrigation—Small Gravitation Schemes—Pipes and Pipe Laying—
by W. Martin Watt, Government Agricultural Engineer.
- Fertility of Soils and Organic Matter, by G. N. Blackshaw, B.Sc.,
F.C.S., Government Agricultural Chemist.
- Hints on Irrigation—Small Earthen Reservoir—by W. M. Watt.
- Winter Cereals, by H. Godfrey Mundy, F.L.S.
- Bean Crops, by H. Godfrey Mundy, F.L.S.

CROPS.

- How Maize can be made more profitable, by H. Godfrey Mundy,
F.L.S.
- Use of Maize as Forage, by R. H. B. Dickson.
- Suggestions for Cotton Growers, by R. H. B. Dickson.
- The Ground-nut or Pea-nut, by H. Godfrey Mundy, F.L.S.
- Manuring of Tobacco on Mr. L. Black's Farm, G. N. Blackshaw, B.Sc., F.C.S.
- Onion Growing, by H. Godfrey Mundy, F.L.S.
- Possible Rotation of Crops for Southern Rhodesia, by H. Godfrey
Mundy, F.L.S.
- Maize Breeding and Seed Selection, by H. G. Mundy, F.L.S., Gov-
ernment Agriculturist and Botanist.
- Chicory Growing, by H. Godfrey Mundy, F.L.S.
- Flax-Linum Usitatissimum, by C. E. F. Allen.
- Soy Beans, by R. H. B. Dickson.

ENTOMOLOGY AND VEGETABLE PATHOLOGY.

- Onion Thrips, by R. W. Jack, F.E.S.
- The Tsetse Fly, by I. E. W. Bevan, M.R.C.V.S.

The Relationship of Ticks and Disease, by R. W. Jack, F.E.S.

The Head Smut of Maize, by H. Godfrey Mundy, F.L.S.

Insect Friends of the Farmer, by R. W. Jack, F.E.S.

Root Gall Worm in Potatoes, by Rupert W. Jack, F.E.S.

Black Orange Aphis, by Rupert W. Jack, F.E.S.

Maize Stalk Borer or Mealie Grub, by Rupert W. Jack, F.E.S.

Regulations affecting the Importation of Potatoes, by Rupert W. Jack, F.E.S.

Selection of Spraying Outfit, by R. W. Jack, F.E.S.

Resin Wash and Means of Applying It, by R. W. Jack, F.E.S.

Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by R. W. Jack, F.E.S.

Tsetse—Preliminary Notes on the Habits of—by R. W. Jack, F.E.S.

VETERINARY.

Bots in Equines, by R. Ferguson Stirling, M.R.C.V.S.

Accidents to Cows after Calving, by J. M. Sinclair, M.R.C.V.S.

African Coast Fever, by L. E. W. Bevan, M.R.C.V.S., (revised edition).

Notes on Bovine Plasmoses of Southern Rhodesia, with special reference to Mashonaland, by L. E. W. Bevan, M.R.C.V.S.

Strangles, by F. D. Ferguson, M.R.C.V.S.

Epizootic Abortion in Cattle, by L. E. W. Bevan, M.R.C.V.S.

The Construction of Dipping Tanks for Cattle.

Dipping and Tick-Destroying Agents, by Lt.-Col. H. Watkins-Pitchford

Animals Diseases Consolidation Ordinance, 1904.

Difficult Parturition of the Cow, by C. R. Edmonds, M.R.C.V.S.

Common Ailments of the Horse, by D. R. Chatterley, M.R.C.V.S.

Detection and Prevention of Diseases of Stock, by L. E. W. Bevan, M.R.C.V.S.

African Coast Fever—Transport Cattle, by L. E. W. Bevan, M.R.C.V.S.

African Coast Fever—Diagnosis of Gland Puncture, by L. E. W. Bevan, M.R.C.V.S.

Notes on Trypanosomes of the Dimorphon Group, by L. E. W. Bevan, M.R.C.V.S. and M. E. MacGregor

Oestrus-ovis in Sheep, by Alec King

Wireworm or Hairworm in the Melsetter District, by E. M. Jarvis, M.R.C.V.S.

MISCELLANEOUS.

Terms for Analysis by the Department of Agriculture, of Products, Soils, Water, etc.

Hints on Brickmaking, by G. S. Dyke.

Loans for Fencing.

Rural Education in Rhodesia, by G. Duthie, M.A., F.R.S.E.

Game Law: Summary of.

Services of Agricultural Engineer.

Lectures for Farmers.

Animals Diseases Amending Ordinance, 1911.

Special Railway Rates for Benefit of Farming Community.

Reports on Experiments—Experimental Station, Salisbury, 1910-1911. by J. H. Hampton.

Importation of Plants Regulations.

Watering and Feeding of Live Stock on Railway.

Formation of Agricultural Credit Associations in Rhodesia, by Loudon M. Douglas, F.R.S.E.

Swine Breeds and Breeding of, by Loudon M. Douglas, F.R.S.E.

Pig Breeding and Feeding, by T. M. Rixon

Government Notices.

No. 200 of 1911.]

[8th June, 1911

MOVEMENT OF CATTLE.

UNDER and by virtue of the powers invested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notice No. 34 of 1911, and in lieu thereof amend section 16 of Government Notice No. 329 of 1910 by the addition of the following clause:—

"Provided, however, that—

- (a) cattle in transit by rail;
- (b) imported cattle detained at a point within any such declared area for purposes of distribution, either immediately or after inoculation;
- (c) bulls for stud improvement purposes;

may be moved within and from any such declared area under the conditions of sections 5 and 6 hereof, and such other conditions as may be imposed by the Chief Inspector of Stock;

(d) and cattle intended for slaughter purposes may be moved under like conditions from one place in an affected area to another place in the same area, and there slaughtered."

No. 203 of 1911.]

[15th June, 1911.

GAME LAW CONSOLIDATED ORDINANCE, 1906.

UNDER and by virtue of the powers conferred upon me by the "Game Law Consolidation Ordinance, 1906, I do hereby extend the provisions of Government Notice No. 40 of 1909, as amended by Government Notices Nos. 128 and 129 of 1909, for a further period of one year from the 30th June, 1911.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tsessebe, Waterbuck and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 160 of 1910 withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1911, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Bulawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 218 of 1911.]

[15th June, 1911.]

BLACK QUARTER OR SPONSZIEKTE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," and the "Animals Diseases Amending Ordinance, 1911," I do hereby declare the farms Carlsville, Richardson's and Inkuku, in the district of Nyamandhlovu, to be actively infected with the disease known as Black Quarter or Sponziedade, for the

purposes of the above Ordinances. Attention is drawn to sub-sections 3 and 4 of section 13 of the first-mentioned Ordinance, which is hereby published for general information.

Section 13 of Ordinance 9 of 1904.

"(3) The carcases of all animals destroyed under this Ordinance, or that may have died from any destructive disease, shall be forthwith burnt by the owner thereof, at the spot as nearly as may be where the death occurred, or shall be disposed of in accordance with orders given by any official duly authorised thereto by direction of the Administrator.

"(4) Any person disposing of, removing or attempting to remove, any part of an animal destroyed, burnt or buried, under the provisions of this Ordinance, shall be liable upon conviction to a penalty not exceeding Fifty Pounds, or, in default of payment, to imprisonment with or without hard labour for any period not exceeding three months, unless the penalty be sooner paid."

No. 85 of 1911.]

[16th March, 1911.]

IT is hereby notified for public information that the subjoined Ordinances entitled

"Additional Appropriation 1910-11 Ordinance, 1911,"

"Animals Diseases Amendment Ordinance, 1911," have been assented to by His Excellency the High Commissioner, and are hereby published in terms of the 36th section of the Southern Rhodesia Order in Council, 1898."

Ordinance No. 2, 1911.]

[Promulgated 17th March, 1911.]

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. So much of the "Animals Diseases Consolidated Ordinance, 1904" (hereinafter referred to as the said Ordinance) and of any other law as may be repugnant to or inconsistent with the provisions of this Ordinance is hereby repealed.

2. The Administrator may, on the outbreak of a destructive disease, or when there is suspicion of the existence of such disease, declare an area around and including the place where such disease exists, or is supposed to exist, actively infected for the purpose of this Ordinance.

3. Whenever an area shall have been declared infected in terms of the last preceding section, the Administrator may, for the purpose of suppressing or controlling disease, cause such fences to be erected along the boundaries of or across any farms or land situated in such area as he may deem necessary.

4. (1) If the landowner shall not pay the cost of erecting any fence as aforesaid upon completion thereof, the cost shall be defrayed in the first instance out of moneys provided by the Legislative Council.

(2) When any fence erected as aforesaid runs along the boundary of a farm, the cost of the erection of such fence shall, if not sooner repaid, be repaid, together with interest at the rate of £5 per centum per annum, by equal yearly instalments commencing two years after the fencing is completed, such instalments being so calculated and fixed that the said cost and interest shall be wholly repaid within a period of fifteen years from the date when the first instalment became due.

(3) Such repayment shall be made by the adjoining landowners whose land has been divided by the fence. Each such landowner shall pay one-half the cost of the dividing fence and interest as aforesaid. When the adjoining land is a native reserve, or a portion of such reserve, the one-half of the cost shall be paid from funds in the local Treasury of the British South Africa Company.

(4) When any fence as aforesaid shall be erected within, and not on and along, the boundaries of any farm, the cost shall be paid from the funds of the local Treasury of the British South Africa Company, and the fence, when no longer necessary for the purpose for which

it was erected, may be removed by the British South Africa Company; provided that the landowner shall have the right to purchase such internal fence at a price representing the total cost of such fence.

- (5) The term "owner" shall mean (a) the person registered as such in the office of the Registrar of Deeds, (b) the British South Africa Company in respect of native reserves, and (c) the local authority in respect of municipalities.

5. Where the bed of a stream or river lies immediately between or constitutes the boundaries of land owned by private owners, the fence may be erected on one or other bank of the river or stream and across it, or partly on one bank, across it, and partly on the other bank, in such manner as may be agreed upon by the owners whose lands are separated by the said stream or rivers. The Administrator may call upon the said owners to agree to the position of the said fence on or before a date fixed by him, and, should they fail to do so, he may cause such fence to be erected without further reference to the said owners. For the purposes of repayment, such fence shall be considered as dividing the lands of adjoining owners, and half the cost shall be recoverable from each owner whose lands are separated by the said stream or river.

6. The Administrator may call upon any owner whose land has been fenced in terms of section 3 or 12 to provide sufficient security for the payment of any sums that may be due to the British South Africa Company in its local Treasury in respect of such fence. If the owner shall fail or refuse to provide such security, the Administrator may cause a notice in writing to be sent to the Registrar of Deeds of the amount due by such owner, and the Registrar shall make an entry thereof in respect of the land fenced. Such entry shall constitute an hypothecation of the land, ranking from the date on which the entry was made and for the amount therein stated; provided that the Registrar may pass transfer of land so hypothecated if the transferee agrees in writing that any sums due and unpaid shall remain and be registered as a charge against the said land.

7. When any land held under lease or permit of occupation has been fenced in terms of this Ordinance, during the term of such lease or permit the lessee or permit holder shall pay to the proprietor of such land yearly, during the continuance of the lease or permit of occupation, interest at the rate of £5 per centum upon so much of the cost of the fence as the proprietor is liable for, and such payment shall be made with the rent of the land, and shall be deemed in law to be part of such rent.

8. Any tenant or holder of land under a permit of occupation having a right to purchase such land at a fixed price shall, on completion of the purchase, pay to the proprietor, in augmentation and as part of the purchase money, any sum paid by such proprietor for the fencing of such land, and shall become and be liable to repay to the British South Africa Company in its local Treasury such sums as remain unpaid, as the same become due and payable in terms of this Ordinance.

9. Where in the case of any local authority the title to land provides that upon the sale thereof the British South Africa Company shall be entitled to receive a proportion of the purchase price, the local authority shall be entitled to deduct from the purchase price of land sold any debt due or amount paid by it in respect of fences on the land so sold erected under this Ordinance.

10. The provisions of sections 14 and 15 of the "Fencing Ordinance, 1904," in regard to repairs shall, *mutatis mutandis*, apply to fences erected in terms of this Ordinance.

11. Where a fence crosses any road used as of right by the public or by any neighbouring landowner, a properly constructed swing gate shall be placed at the point of crossing.

12. Any person opening such gate, except for the purpose of passing through, or omitting to close such gate after having passed through, and any person damaging such gate and omitting to immediately repair such damage, shall be liable to a fine not exceeding £10, or in default of payment to imprisonment with or without hard labour for a period not exceeding one month.

13. The Administrator may, for the purpose of the more effective prevention or control of disease, apply the provisions of this Ordinance in respect of fencing to municipalities and townships and such land adjoining as may be deemed expedient, and to places within a radius of ten miles of an area declared actively infected in terms of section 2 hereof, if, owing to the number of cattle in such places, or other causes, it appears expedient.

14. (1) The owner or proprietor of the land along the boundaries of which fences have already been erected by the British South Africa Company for the purpose of preventing the spread of African Coast Fever in cattle shall be and is liable to repay to the British South Africa Company in its local Treasury one-half of the cost of so much of the fence as may be along the boundary of such land. The provisions of sections 7 and 8 of this Ordinance shall apply in the case of land held under lease or permit of occupation along the boundaries of which fences have already been erected. The British South Africa Company may remove any such fence already erected which is within and not on or along the boundaries of any land when no longer necessary for the purposes for which it was erected.

(2) Any payment due in respect of any such fence may be made as provided by section 4 of this Ordinance, and under the like conditions as to security for such payment as are prescribed under section 6.

15. Within any area declared by the Administrator to be actively infected under the provisions of section 2, or to which the provisions of this Ordinance shall have been applied in terms of section 12, the Administrator may, for the purpose of more effectively preventing the spread of disease, cause to be constructed on any land a dipping tank and any structures incidental thereto or other appliances for the dipping of stock, and may recover the expenditure incurred from the owner of the land on which such tank, structures or appliances have been constructed. The cost of such tanks, structures or appliances shall be paid on the same terms and under the same conditions as are applicable to boundary fences under sections 4, 6, 7 and 8 of this Ordinance.

16. In addition to any penalties that may be imposed under the said Ordinance or any amendment thereof, or under any regulations framed thereunder for the unlawful movement of cattle, the Court of the Magistrate before which the case is tried or the High Court in the like instance may direct the confiscation of any cattle unlawfully removed, and such cattle, if infected with disease or likely to convey infection, shall be destroyed without compensation. Should there be no danger of infection the Administrator may order such cattle to be temporarily kept at any spot denoted by him and then sold. The proceeds of any such sale shall be paid to the British South Africa Company in its local Treasury.

17. Section II, sub-section (1) of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

"Should any Inspector, Sub-Inspector or any person specially authorised by the Administrator to carry out the provisions of this Ordinance know or suspect that any animal is infected with any destructive disease, such Inspector, Sub-Inspector or other authorised person may forthwith place such animal in quarantine, together with such land as is necessary, for its isolation, and such animals as have been or are suspected of having been in contact with such animal or with infection. Notice of such quarantine shall be given in writing to the owner or custodian of such animal and to the Magistrate of the district, and shall remain in force for such time as the Chief Inspector or Controller of Stock may direct, unless the Administrator shall sooner, if he thinks fit, issue the notice referred to in sub-section (2) of section 5. A copy of the notice of any such quarantine shall be posted at the office of the Magistrate, and shall be inserted by the Magistrate in some newspaper, if any, circulating in the district."

18. Section 16 of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Any Government Veterinary Surgeon or any person thereto authorised by the Controller of Stock, Chief Inspector or by a Magistrate may enter any land, building, kraal or enclosure for the purpose of inspecting animals. Should any animal be found to be infected with any destructive disease, or should such infection be reasonably suspected, he may quarantine such animals as in this Ordinance provided, and may order the proper disinfection of any building, kraal or enclosure in which such animal is or may recently have been, and the furniture and fittings thereof. Should it be impossible to properly disinfect such stable, kraal or enclosure, furniture or fittings in any of them, he may order the destruction thereof; provided that no building, kraal or enclosure shall be destroyed unless the owner consents thereto in writing, or, failing such consent, the Administrator orders that such destruction be carried out.”

19. Section 22, sub-section (1) of the said Ordinance is hereby amended by the addition of the following words after the word “obtained” in the twelfth line of the said sub-section, “and any person receiving or taking delivery of any animals without having ascertained that such permit has been obtained.”

20. This Ordinance may be cited as the “Animals Diseases Amending Ordinance, 1911,” and shall be read as one with the “Animals Diseases Consolidation Ordinance, 1904,” and the “Animals Diseases Amendment Ordinance, 1910.”

No. 295 of 1908.]

[1st October, 1908.]

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the “Animals Diseases Consolidation Ordinance, 1904,” I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed existence of destructive diseases affecting the said animals in the said countries:—

- (1) All animals from the island of Mauritius.
- (2) All animals from German South-West Africa and all animals except donkeys from German East Africa.
- (3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.
- (4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.
- (5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingswilliamstown, Komgha, Peddie, Somerset East, Stockenström, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

(1) Plumtree shall be regarded as the port of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Office at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of Melsetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sawerombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about $2\frac{1}{2}$ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed Block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roods distant, bounded north-westwards by a line about 1,350 roods in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roods in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly

known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary line of the Penhalonga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I,
residing at
in the district ofin the
.....Colony, do solemnly and sincerely
declare that the animals enumerated below are free from any contagious
disease, including scab, and have not been in contact with any infected
animals within six months from date hereof, and that to the best of my
knowledge and belief such animals in travelling to* Station
will not come in contact with any animals amongst which scab or any
other contagious disease has existed during that period; further, that
such animals were thoroughly disinfected by dipping on.....
and will enter Southern Rhodesia within ten days of having been
dipped.

And I make this solemn declaration conscientiously believing the same
to be true.

Declared to at on this day
of before me.

Resident Magistrate, Government Veterin-
ary Surgeon, Scab Inspector, or Police Officer
of district from which animals are being
sent.

Number and general description of animals being sent

Owner's name and Address

Place in Southern Rhodesia to which animals are being sent

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION I, GOVERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including scab, and to the best of my knowledge and belief have not been in contact with any infected animals nor come from, or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date.....

Place.....

.....
Signature of Government Veterinary Surgeon.

Number and general description of animals.....Pigs,Sheep,
.....Goats.

Place from which animals are to be sent.....

Owner's Name and Address.....

Place in Southern Rhodesia to which it is desired to send the animals
.....

No. 110 of 1908.]

[16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
- (2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
- (4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.
- (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcasses thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.

- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.
2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—
- (1) Importation shall be through and direct from the Coast Ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
- (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.
3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.
4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
2. Number and Class of cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
4. Area or Farm and District to which Cattle are to be moved.....
- Applicant's Signature.....
- Date
- Application
- Permit No.

ANNEXURE "B."

I,.....
 residing on the farm
 in.....do solemnly and sincerely
 declare that the..... (number in
 writing) animals also enumerated below have been in my possession since
 birth, and that lung-sickness, pleuro-pneumonia or other contagious or
 infectious disease has not existed amongst any of my cattle, nor on my farm,
 nor among any cattle with which these animals have been in contact within
 the last four years, and that these animals have never been exposed for sale
 in any public market or stock fair, nor been in contact with strange cattle,
 and that to the best of my knowledge and belief such cattle in travelling to
Station (i.e., station where cattle are to be
 trucked) will not come into contact with any animals amongst which lung-
 sickness or any other contagious or infectious disease has existed during that
 period.

Number of Animals.....Bulls.....Heifers.....
Breed.....

Seller's Name and Address.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at.....on this.....
day of.....before me,

Resident Magistrate for the district of

No. 60 of 1911.]

[23rd February, 1911.

IMPORTATION OF SHEEP AND GOATS FROM THE CAPE OF GOOD HOPE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section I of the Regulations published under Government Notice No. 295 of 1908 by the insertion of the words "or Examiner of Stock" immediately after the word "officer" where it occurs in the said section.

No. 60 of 1909.]

1st April 1909

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal Government Notice No. 124 of 1908, and do hereby declare and make known that, notwithstanding anything to the contrary elsewhere provided, the importation of cattle for bona fide slaughter purposes may be permitted into the Umtali district from the adjoining Portuguese territory, under the following terms and conditions:—

- (1) The importation and disposal of cattle, introduced in terms of these regulations, shall be under the absolute control and direction of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.
- (2) The importation shall be by rail only, and all cattle shall be detrucked at the slaughter enclosure and immediately confined therein.
- (3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."
- (4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

- (5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.
- (6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.
- (7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

No. 45 of 1909]

[13th March, 1909

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 223. of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcasses of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence: or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

No. 249 of 1908]

[27th August, 1908

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act, 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

No. 391 of 1908]

[17th December, 1908

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdraw the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

- i. Off Neck or Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches

from and directly underneath the brand last imprinted, according to the following table:—

- i. Off Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

- i. On Near Side or Ribs;
- ii. Near Rump (or Thigh);
- iii. Off Shoulder;
- iv. Off Side or Ribs;
- v. Off Rump (or Thigh).

(d) In the case of ostriches:—

- i. On Near Thigh;
- ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette".

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

No. 52 of 1909]

[25th March, 1909

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEON'S SERVICES ARE AVAILABLE TO THE PUBLIC.

ON and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge for the following purposes only:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lung-sickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziette (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases:—

Horsesickness, Lung-sickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz.:—

	£	s.	d.
(1) For every professional visit within three miles of his office or residence	0	5	0
(2) For every professional visit beyond such distance plus an additional charge of 2s. 6d per hour whilst engaged in such visits, or £2 2s. a day of 24 hours;	0	10	6
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees:—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each	1	1	0
c. " bulls ,, 	0	5	0
d. " donkeys ,, 	0	10	6
e. For parturition cases, mares, each	2	2	0
f. For parturition cases, cows, each	1	1	0
g. For other operations, according to nature, from 5s. to £2 2s.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

No. 325 of 1911.]

[12th October, 1911.

"FENCING ORDINANCE, 1904."

UNDER and by virtue of the powers conferred upon me by the "Fencing Ordinance, 1904," I do hereby define the area as described hereunder to be a district for the purpose of the said Ordinance, and, in terms of section 4 thereof, bring the provisions of the said Ordinance into operation in the aforesaid district.

DESCRIPTION OF AREA.

That portion of the native district of Bulalima-Mangwe within the following boundaries:—

From the north-west beacon of the farm Peace, along the northern and north-eastern boundaries of this farm, the Seventh Day Adventists' Mission Station and Springfontein; thence along the north-eastern boundary of Paul's Rest, the northern and eastern boundaries of Pendennis and Honey Bird Kop, the northern boundary of Vreigevecht, the northern, eastern and southern boundaries of La Concorde to the boundary of the farm Vreigevecht; thence in a southerly direction along the eastern boundaries of that farm and the farm D'Hoop; thence along the northern and eastern boundaries of the farm Forwards, the eastern and southern boundaries of Ravenswood, the south-eastern and south-western boundaries of Edenvale, the south-western boundaries of Wilton, Stretton and Sandown South; thence along the western boundaries of Sandown South to the most westerly beacon of the farm Mizpah; thence along the northern boundary of that farm to the southern beacon of the farm Peace; thence along the south-westerly boundary of that farm to the point first-named.

No. 309 of 1909]

[30th December, 1909

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from overseas, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expense of the consignee and the diseased tubers destroyed.

- (3) A charge of 6d. per bag or case will be made for sorting.
- (4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.
- (5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

No. 306 of 1911.]

[5th October, 1911.]

IMPORTATION OF PLANTS, ETC., REGULATIONS.

WHEREAS the insect pest known as San Jose or pernicious scale (*Aspidiotus perniciosus*, *Comstock*) has been discovered infesting nursery stock, fruit trees and other plants in the Transvaal Province of the Union of South Africa.

Now, therefore, under and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that, from and after this date and until further notice, the introduction into Southern Rhodesia of any plant or plants, not being fruit, seeds, bulbs, cut flowers, vegetables or vegetable transplants, grown in the Transvaal Province of the Union of South Africa is prohibited unless special permission in respect to each consignment be first obtained from the Director of Agriculture, Salisbury, Southern Rhodesia.

No. 263 of 1909]

[25th November, 1909.]

IMPORTATION OF SWINE.

NOTWITHSTANDING the prohibition which exists under section 1 subsection 3 of Government Notice No. 295 of 1908 against the importation of swine from the Colony of the Cape of Good Hope, I, under and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide that swine may be imported from the Cape of Good Hope under a permit issued by the Chief Inspector or Examiner of Stock, and subject to any examination and quarantine on entry that may be necessary, and to such other conditions as may be deemed expedient to attach to such importations.

No. 211 of 1909.]

[16th September, 1909.]

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—

Grass	Straw
Hay	Lucerne Hay
Forage	Green Lucerne
Sugar Cane	

or any other bedding or fodder plant.

No. 264. of 1909]

[25th November, 1909]

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of horns and raw hides of cattle from the Bechuanaland Protectorate.

Any horns or hides introduced in contravention of this prohibition shall be confiscated and destroyed.

No. 79 of 1910]

[7th April, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby direct that all cattle found within an area of twenty miles of the Crocodile River, in the native districts of Tuli and Chibi, in contravention of the provisions of Government Notice No. 47 of the 10th March, 1910, shall be forthwith destroyed.

No. 127 of 1910.]

[2nd June, 1910.

IMPORTATION OF CATTLE FROM NORTH-EASTERN RHODESIA AND NYASALAND.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that the importation of cattle from North-Eastern Rhodesia and Nyasaland may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle be first had and obtained.
2. All cattle shall be introduced by way of the town or port of Feira, which is hereby declared a port of entry.
3. All applications for permission to import shall be accompanied by

[1] A certificate by a Government Veterinary Surgeon of the territory of origin that

- a. the districts from which they come and through which they pass are free from contagious diseases of animals;
- b. the animals in respect of which the application is being made have been examined and are free from any destructive disease.

[2] A certificate from a Government Veterinary Surgeon of North-Eastern Rhodesia, with respect to cattle from Nyasaland, that the districts of North-Eastern Rhodesia through which they have passed are free from contagious diseases of animals.

Provided, however, that until the Government of Nyasaland obtains the services of a qualified Veterinary Surgeon the certificate of a District Commissioner as to [1] a. and the certificate of a Government Veterinary Surgeon of North-Eastern Rhodesia as to [1] b. shall be accepted.

4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.
5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.
6. Any person found introducing cattle in contravention of these regulations or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

SCHEDULE "A."

1. CERTIFICATE UNDER SECTION 3. [1], a.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,
Calves,
Oxen and Bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature.....
 Government Veterinary Surgeon
 (or District Commissioner, Nyasaland).

2. CERTIFICATE UNDER SECTION 3. [1], b.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,
Calves,
Oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....
 Government Veterinary Surgeon.

3. CERTIFICATE UNDER SECTION 3. [2].

I hereby certify that the following cattle belonging to Mr.....

.....Cows and heifers,
Calves,
Oxen and bulls,

in transit from Nyasaland to Southern Rhodesia, will not traverse any area infected with a destructive disease of cattle.

Signature.....
 Government Veterinary Surgeon.

NOTE.—Cattle from North-Eastern Rhodesia require Certificates Nos. 1 and 2.

Cattle from Nyasaland require Certificates Nos. 1, 2 and 3.

No. 245 of 1910.]

[8th September, 1910.

MOVEMENT OF CATTLE: GOROMONZI NATIVE DISTRICT.

NDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend Government Notice No. 168 of 1910, section (2), by the insertion of the following clause:—

- (e) transport cattle for the purpose of mine supplies within an area comprising the farms—

Mount Shannon	Cromlet	Learig	Alderley
Rudolphia	Gardiner	Mabfen	Kilmuir
Guernsey	Gilnochie	Grazeley	Thornvlei

No. 211 of 1910]

[4th August, 1910.

IMPORTATION OF CATTLE FROM NORTH-WESTERN
RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

(a) the districts from which they come and through which they pass are free from contagious diseases of animals;

(b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for.

ANNEXURE "A."

Certificates under Section 3.

(a) I certify that I have examined the following cattle belonging to Mr.

.....cows and heifers,

.....calves,

.....oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....

Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr.

.....cows and heifers,

.....calves,

.....oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....

Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

No. 142 of 1910]

AFRICAN COAST FEVER.

[16th June, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the movement of cattle within the native districts of Umzingwane, Matobo and Insiza, and all permits issued in respect of these districts, and now current, are hereby cancelled.

No. 229 of 1910]

AFRICAN COAST FEVER.

[17th August, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel so much of Government Notice No. 142 of 1910 as prohibits the movement of cattle in the native districts of Matobo and Insiza.

No. 329 of 1910.]

AFRICAN COAST FEVER.

[15th December, 1910.

REGULATIONS regarding the movement of cattle and the prevention and suppression of disease.

1. Under and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 268 of 1907, 356 of 1908, 39 of 1909, 216 of 1909, 281 of 1909 and 202 of 1910, and make the following provisions in lieu thereof,

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

General Movement.

3. For the purposes of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission:—

- (a) single farms;
- (b) an area, the property of one owner, enclosed by a substantial fence;
- (c) an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land. The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission in writing of an inspector, sub-inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall be issued—

- (a) without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the District, over which land or reserve such cattle shall pass, whether along roads or otherwise; provided, however, that if the Chief Inspector or Controller of Stock shall consider that such consent is withheld without good and sufficient cause, he may issue a permit of removal without such consent;

- (b) for the removal of cattle from one native district in Matabeleland to or through another without the approval of the Government Veterinary Surgeon at Bulawayo;
- (c) from any native district to or through another without the consent of the Native Commissioner of such other district.

Slaughter Cattle.

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose, and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same, except for the purpose of being slaughtered at the appointed abattoir; and, if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock.

Transport Cattle.

9 From and after the 31st March, 1911, the use of cattle for draught purposes is prohibited, except within the boundaries of the places defined in section 3, unless permission shall have been obtained in terms of section 12 hereof.

10. It shall be competent for the owners or occupiers of contiguous farms jointly to petition the Administrator in writing for permission to employ cattle for draught purposes between the said farms and a point on the railway line or other centre. The Administrator, on receiving a petition as aforesaid, may cause a notice to be addressed, either by publication in a newspaper or in such manner as may be deemed expedient, to persons owning or occupying farms adjoining those of the petitioners, and farms over which the said petitioners desire to pass to the aforesaid railway or centre. Such notices shall call upon the persons to whom they are addressed to lodge their objections (if any) to the petition being acceded to, and shall fix a date by which such objections must be received. Forms of petition or objection shall contain particulars of the number and value of the cattle on the farms represented by the petitioners and objectors respectively.

11. On the expiration of the period fixed for the receiving objections as aforesaid, the Administrator shall consider the petition and the objections thereto, and make such decision thereon as may appear expedient.

12. Whenever the Administrator shall have acceded to a petition as aforesaid, permission in writing may be granted by such persons as are mentioned in section 5 hereof for the use of cattle for draught purposes within the area comprising the farms representing the petitions and objectors, and between such area and the point or centre mentioned in the said petition.

13. Permission in writing may be granted by such persons as are mentioned in section 5 hereof for the working of cattle in connection with mines; provided such working is confined to an area such as is provided for in section 12 hereof.

14. Persons engaged in the working of mines not situated in areas as aforesaid may apply to the Administrator for permission to employ cattle for draught purposes in a specified area around such mines, or between such mines and on a point on a railway or other centre, and the Administrator, on receipt of such application, shall consider the same, and may call for objections thereto, and thereafter make such order thereon as he may deem fit.

15. Notwithstanding the provisions of sections 12, 13 and 14, no permit shall authorise the working of cattle—

- (a) in any area declared to be actively infected in terms of section 16 hereof;

- (b) which are not clearly and distinctly branded with the registered brand of the owner;
- (c) in any wagon or vehicle, which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

General Provisions.

16. On the outbreak or suspected outbreak of disease, the Administrator may declare an area around and embracing the place of outbreak or suspected outbreak to be actively infected, whereupon all movement of cattle from place to place within such area shall be immediately suspended. The removal of green forage, hay, fodder, bedding, reeds, manure, or of such other articles as may reasonably be supposed capable of conveying infection shall be prohibited from such area, save and except with the special permission of the Administrator.

17. Whenever an area shall have been declared actively infected in terms of section 16 hereof, every person within such area, or within such further area as may be specified, owning or in charge of cattle shall, upon the death of any such cattle, immediately report the death to the nearest Cattle Inspector, Native Commissioner, or Police Officer, and shall also, if a European, render to any such official, not later than the tenth day of each month, a return in the form hereunto annexed, shewing the number of cattle in his possession on the last day of the preceding month, any increase or decrease of the number of cattle during such month, and a statement as the cause of such increase or decrease. Such returns shall, in the case of natives, be made verbally to the Native Commissioner or other duly authorised official.

18. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

19. All cattle within the limits of the various commonages and town-lands, or depastured on common grazing ground, shall be dipped or sprayed at least once in every fourteen days, unless the Chief Inspector shall, for sufficient reason, authorise the suspension of such dipping or spraying.

20. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Cattle Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier, or manager and the said native owners.

21. All permits for the removal of cattle issued under the provisions of the said Ordinance, or of any regulations framed thereunder, shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks, or unless they have been effectively cleansed by dipping, spraying, or other process within fourteen days of being allowed on such road or other place.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

ANNEXURE.

AFRICAN COAST FEVER.

Return of Cattle for month ending.....19.....

No. of Cattle.	Increase during month.	Decrease during month.
Cows.....		
Bulls.....		
Oxen.....		
Young Stock.....		
Calves.....		
Cause of decrease.....		
Cause of increase.....		
Name of farm.....		

(Owner's Signature.)

No. 14 of 1911.]

[12th January, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 168, 281 and 336 of 1910, and in accordance with section 16 of Government Notice No. 329 of 1910 do hereby declare the following areas to be actively infected with the disease known as African Coast Fever:—

1. (a) The following farms and all adjoining farms in the native district of Goromonzi:—

Stamford,	Gillingham,	Fontainebleau,
Homefield,	Outspan,	Gletwyn,
Rainham,	Park Ridge,	Salisbury Commonage.

The following farms in the native district of Mazoe and all adjoining farms in the native districts of Mazoe and Goromonzi:—

Bitton, Syston.

(c) The following farms in the native districts of Marandellas and Goromonzi:—

Rockery,	Rakodzi,	Glensommers,
Longlands,	Springvale,	Elmswood,
Progress,	Retreat,	Rusawi Outspan,
Revolt,	Uplands,	Lottie.

(d) The native district of Inyanga.

(e) The native district of Makoni.

(f) The native district of Umzingwani.

(g) The following farms in the native district of Insiza:—

Centrebank,	York,	Kildare,	Lincoln,
Woodhouse,	Kogha,	Eldorado,	Bonnybrook,
Fairview,	Outspan No. 3,	Lancaster,	Blagdon,
Idutwa,			

2. The following area is defined for the purposes of section 17 of the said Notice, viz.:—That portion of the native district of Goromonzi lying west of and including the following farms:—

Borrowdale, Springs, Stuhm, Chishawasha, Hartmanns, Caledonia, Sebastopol, thence down the Ruwa River to the Hunyani River.

3. Sections 16 and 17 of Government Notice 329 of 1910 are reprinted hereunder for general information:—

“16. On the outbreak or suspected outbreak of disease, the Administrator may declare an area around and embracing the place of outbreak or suspected outbreak to be actively infected, whereupon all movement of cattle from place to place within such area shall be immediately suspended. The removal of green forage, hay, fodder, bedding, reeds, manure, or of such other articles as may reasonably be supposed capable of conveying infection shall be prohibited from such area, save and except with the special permission of the Administrator.

“17. Whenever an area shall have been declared actively infected in terms of section 16 hereof, every pers on within such area, or within such further area as may be specified, owning or in charge of cattle shall, upon the death of any such cattle, immediately report the death to the nearest Cattle Inspector, Native Commissioner or Police Officer, and shall also, if a European, render to any such official, not later than the tenth day of each month, a return in the form hereunto annexed, shewing the number of cattle in his possession on the last day of the preceding month, any increase or decrease of the number of cattle during such month, and a statement as to the cause of such increase or decrease. Such returns shall, in the case of natives, be made verbally to the Native Commissioner or other duly authorised official.

No. 33 of 1911.]

[2nd February, 1911.]

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the “Animals Diseases Consolidation Ordinance, 1904,” I do hereby, in accordance with section 16 of Government Notice No. 329 of 1910, declare the following areas to be actively infected with the disease known as African Coast Fever:—

Farm Hayden, Goromonzi district.	
Farm Tilbury, Melsetter district.	
Farm Aberfoyle,	} Selukwe district.
Farm Brooklands,	
Farm Riversdale,	

No. 34 of 1911.]

[7th February, 1911.]

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the “Animals Diseases Consolidation Ordinance, 1904,” I do hereby amend section 16 of Government Notice No. 329 of 1910, by the addition of the following clause:

“Provided, however, that cattle intended for slaughter purposes may be removed to a centre of consumption under the conditions of section 6 hereof, and under such other conditions as may be prescribed by the Chief Inspector of Stock.”

No. 51 of 1911.]

[16th February, 1911.]

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the “Animals Diseases Consolidation Ordinance, 1904,” I do hereby amend section 1 of the Regulations published under Government Notice No. 254 of 1910, by omitting the words “an area of twenty miles from the Shashi and Ramaquabene Rivers,” and substituting the words “an area bounded by a line from the junction of the Shashi and Shashani Rivers and continuing up the former river, following the borders of the Territory to the most southern beacon of

Mphoeng's Extension Reserve, thence along the eastern boundary of the Reserve to a point shortly south of the south-west beacon of the farm "Lewisdale," thence south-easterly and easterly along a demarcated line to the junction of the Bulawayo-Macloutsi road and Bulawayo-Tuli old road, and thence along the latter to the Shashani River and down this river to the starting point."

No. 59 of 1911.]

[23rd February, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," and in accordance with section 16 of the Regulations published under Government Notice No. 329 of 1910, I do hereby declare the whole of the native district of Matobo to be an area actively infected with the disease known as African Coast Fever.

No. 154 of 1911.]

[9th May, 1911

AFRICAN COAST FEVER.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance of 1904," I do hereby declare the whole of the Native district of Bulawayo to be an area actively infected with the disease known as African Coast Fever.

AFRICAN COAST FEVER.

[25th May, 1911

ATENTION is drawn to Government Notice No. 184 of 1911, defining certain areas wherein movement of cattle for draught purposes may be allowed subject to the provisions of Government Notice No. 329 of 1910.

Under Government Notices Nos. 14, 106, and 154 of 1911 certain portions of the country have been declared to be actively infected with African Coast Fever, were all movement of cattle is still prohibited.

The areas mentioned in the subjoined list include portions of infected veld, and no movement of cattle for draught purposes will be permitted within these until further notice.

No. 4 Figtree Area.

„ 5 Westacre Area.

„ 6 Bulawayo Area.

„ 7 Heaney Junction Area.

„ 8 Bembesi Area.

„ 10 Insiza South Area.

„ 20 Matopo Terminus Area.

„ 40 1654½-Mile Peg Area.

„ 41 Salisbury A Area.

„ 42 Salisbury B Area.

„ 43 Salisbury C Area.

„ 44 Salisbury D Area.

„ 47 Marandellas North Area.

„ 48 Marandellas South Area.

„ 50 Headlands Area.

„ 51 Junction Mazoe and Lomagundi Railway Area.

„ 52 23-Mile Peg Lomagundi Railway Area.

„ 53 Passaford Area.

F. J. CLARKE,
For the Director of Agriculture.

No. 288 of 1911.]

[7th September, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend Section 1 of Government Notice No. 14 of 1911 by the deletion of the word "Gletwyn" in sub-section (a) and the cancellation of sub-sections (b) and (g).

No. 302 of 1911.]

[28th September, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend the Regulations framed under Government Notices Nos. 106 and 154 of 1911 by excluding the following farms from the operation thereof:—

The farms Honeybird Kop, Pendennis, Welcome and Vreigevecht, situated in the native districts of Matobo and Bulawayo.

No. 303 of 1911.]

[28th September, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," and the "Animals Diseases Amending Ordinance, 1911," I do hereby declare the following areas (for transport cattle, published under Government Notice No. 184 of 1911) to be actively infected with the disease known as African Coast Fever, for the purposes of the said Ordinances.

DESCRIPTION OF AREAS.

7. *Heaney Junction.*

An area including the following farms: Maxim Hill, Three Fountains, Driehoek, Maldod, Imbeza Block, Springs, Hope Valley, Duncal, Kirton and Wilsondale.

8. *Bembesi Station.*

An area bounded by the Heaney Junction and Bulawayo areas as far as the Farm Kennebec; thence along the western boundaries of Kennebec, and by and including the farms Kennebec, Galeta's Kraal, and Umgusa Block; thence along the north-eastern boundaries of Winter, Spring, and Eland, to the south-western beacon of Westland Row; thence along the western boundaries of Westland Row, Bembezaan, and Westgate; thence by and including Goodwood Block, Gourlay's Block, Crescens Syndicate Block, Lavender Grange, Dromoland, Oscardale, Half Ration Rancho, Wessels, Greenlands, Lochard Block, Rouseville, Inyozan, Fochabers sub-division A, Kodhwayo, Zimbili, and Victory.

No. 308 of 1911.]

[5th October, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby—

1. Cancel and withdraw Section 19 of Government Notice No. 329 of 1910 and in lieu thereof substitute the following:—

"19. All cattle within the limits of the various commonages, townships and actively infected areas, or on common grazing ground, shall be dipped or sprayed at least once every three days, unless the Chief Inspector of Stock shall, for sufficient reason, authorise the extension of the time between such dipping or spraying, or the entire suspension of the same."

2. Further amend Section 16 of the aforesaid Government Notice by the addition of the following clause to the proviso published under Government Notice No. 200 of 1911:—

"(e) Cattle for *bona fide* farming and dairy purposes may be moved into and within such declared areas under the conditions of Sections 5 and 6 of the above-mentioned Government Notice, and under such other conditions as may be imposed by the Chief Inspector of Stock.

No. 223 of 1910.]

[18th August, 1910.]

IMPORTATION OF ANIMALS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of animals and dogs from the following countries:—

Persia
British Burmah
Assam
China and bordering countries, including Korea
French Indo-China
Dutch East Indies
Hong Kong
Federal Malay States
The Philippines
Zanzibar

and all other countries where surra is known to exist.

No. 301 of 1911.]

[28th September, 1911.]

UNDER and by virtue of the powers in me vested by the "Fencing Ordinance, 1904," it is hereby notified for general information that the provisions of the said Ordinance shall, in terms of Sections 3 and 4, Part I., be brought into force and applied to the native district of Gwelo, excluding the township of Gwelo, as from the 30th day of September, 1911.

No. 254 of 1910.]

[22nd September, 1910.]

SOUTHERN BOUNDARY.

UNDER and by virtues of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

1. All cattle within an area of twenty miles from Shashi and Ramagwabane Rivers in the native districts of Tuli-Manzanyama and Bulalima-Mangwe, save and except westwards of the south-eastern boundary of the Mphoeng's reserve, shall, within one month from date hereof, be removed therefrom by the owners to such place or places as shall have been approved by the Native Commissioners of the said native districts respectively.

2. The introduction of all cattle into the aforesaid area is prohibited.

3. Any person refusing or neglecting to remove cattle from the area, as herein provided or introducing cattle into such area, shall be liable to the penalties provided by the aforesaid Ordinance, and all cattle found in the said area in contravention of this Notice shall forthwith be destroyed.

No. 240 of 1910.]

[1st September, 1910.]

INSECT PESTS.

UNDER and by virtue of the powers vested in me by the "Nursery Ordinance, 1909," I hereby proclaim the undermentioned insects to be pests within the meaning of the said Ordinance:—

The Red Scale (*Chrysomphalus aurantii*)
The Oleander Scale (*C. hederæ*)
The Circular Purple Scale (*C. aonidum*)
Ross's Black Scale (*C. rossi*)
The Purple or Mussel Scale (*Lepidosaphes beckii*)
The Long Scale (*L. gloverii*)
The White Peach Scale (*Aulacaspis pentagona*)
Woolly Aphis or American Blight (*Schizoneura lanigera*).

FENCING ORDINANCE OF 1904.

AREAS WITHIN WHICH IN OPERATION.

THAT portion of the native district of Bubi, Matabeleland, within the following boundaries:—

From the S.W. beacon of Sevui (Vincent's) Farm on the Khami River, along the W. and N. boundaries of this farm, thence along the W. boundaries of Steven's and Rochester farms to the N.W. beacon of Rochester, thence along the N. boundary to its junction with the Umguzan Block, thence along the W. boundary of this block to the Umgusa River, thence up the latter till it strikes the N.W. boundary of "Galeta's Kraal," thence in a northerly direction along the N.W. border of this farm and the outspan, thence along the N.E. border of this outspan and Shiloh and the E. boundaries of Shiloh and Paddy's Valley, and the N.E. boundaries of Sailor's Hope to the farms Dingaan along the N. boundaries of Dingaan, Hambagahele, Gravesend Extension and the N.W. boundary of Induba to the Bembesi River, thence along this river to the S.W. beacon of Battlefield Block, thence along that portion of the S. and S.W. boundaries of the native district of Bubi to the S.W. beacon of Sevui Farm.

That portion of the native district of Goromonzi and Mazoe bounded

To the Northwards by a line running along the boundaries of the following farms, and leaving them to the south thereof: Nalire, Sigaro, Selby, Mount Hampden, Bendauch, Glenara, Eksbank, Ingleborough, Calgary, Welston, Borrowdale Estate, The Springs, The Grove, Umritsur, The Meadows.

To the East and South-Eastwards by a line running along the boundaries of the following farms leaving them to the west and north-west thereof: The Meadows Rudolphia, Thornvlei, Grasely, Guernsey, Gilnockie, Gardiner, Sebastopol, Ventersberg, Epworth, Hatfield Estate, Godavery, Iddesleigh.

To the South and South-Westwards by a line running along the boundaries of the following farms, leaving them to the north and north-east thereof: Iddesleigh Extension, Boutelle, Eyerston, Spreckly, Waterfall, Makabusi Outspan, Willowvale, Heaney, Whitcliff Rainham and Sunnyside.

To the Westwards by a line running along the boundaries of the following farms, leaving them to the east thereof: Sunnyside, Derry, Penrose and Nalire, but excluding the following properties: all freehold properties with in the Salisbury town lands, the Ardbennie township, and the farms Avondale and Mount Pleasant.

That portion of the native district of Bulalima-Mangwe within the following boundaries:—

From the easternmost beacon of Farm Highfield along its eastern boundary, thence along the north-east boundaries of farms Holmwood and Wesleyan Mission Station to the point where the latter boundary intersects the Tsegwani River, thence down the Tsegwani River to the point where it intersects the Bechuanaland Protectorate border in a southerly and easterly direction to S.W. of the farm Dryden, thence along the southern and eastern boundaries of farm Dryden, to the northern beacon of farm Luscombe, thence along the southern and eastern boundaries of Plumtree Outspan to the point where the railway line enters the outspan, thence along the north side of the railway line to the easternmost beacon of farm Highfield.

No. 341 of 1910.]

[22nd December, 1910.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel section 3 of Government Notice No. 295 of 1908, in so far as it relates to the area described in section 6 of schedule "A" being reserved for the quarantining of animals for certain diseases, and declare that the area be set aside for the segregation of cattle brought to Gwelo for sale.

No. 61 of 1909.]

[1st April, 1909.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the areas described in Government Notice No. 295 of 1908, as areas set apart for the depasturing and quarantining of animals for slaughter in the township of Umtali and at Penhalonga, and in lieu thereof substitute the following:—

UMTALI.—*Description of Area.*—A piece of fenced land situated on the old Darlington Farm section of Umtali commonage.

PENHALONGA.—*Description of Area.*—A piece of fenced land situated on plot No. 2, Imbeza Plots.

[15th August, 1911.

IMPORTATION OF STOCK FROM EUROPE.

IT is hereby notified for public information that, owing to an outbreak of Foot and Mouth Disease in Holland and Great Britain, the Union Government has published regulations prohibiting all importation of cattle, sheep and pigs from the Continent of Europe and Great Britain. Provision has, however, been made for the admission of animals already on board ship, subject to inspection and such conditions as the Minister for Agriculture may see fit to impose.

No. 271 of 1911.]

[17th August, 1911.

SYMPTOMATIC ANTHRAX (SPONSZEIKTE).

WHEREAS an outbreak of Symptomatic Anthrax (Sponszeikte) has occurred on the farm "Innesfallen," in the district of Insiza, I, under and by virtue of the power conferred on me by section 2 of the "Animals Diseases Amending Ordinance, 1911," do hereby declare the said farm to be actively infected for the purpose of the said Ordinance.

No. 353 of 1911.]

[16th November, 1911.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby suspend the operations of sections 9, 10 and 12 of the said Ordinance until the 30th November, 1912, in regard to game in class "B," and the following game in class "C," viz.:—Eland, koodoo, zebra and Burchell's zebra or quagga, within the following area:—

DESCRIPTION OF AREA.

An area bounded by a line drawn from the junction of the Merowa and Umfuli rivers, up the Umfuli to its junction with the Susenje, thence up the Susenje and Massome rivers to the headwaters of the latter; thence to the drift where the Sinoia-Urungwe road crosses the Inyonga river; thence northerly along this road to the Chidzurgwe hill; and thence direct to the junction of the Merowa and Umfuli rivers.

No. 285 of 1911.]

[7th September, 1911.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of Clause 11 of Government Notice No. 45 of 1909 to be in force in the native districts of Charter and Chilimanzi for a period of three months from date hereof.

No. 304 of 1911.]

[28th September, 1911.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of Clause 11 of Government Notice No. 45 of 1909 to be in force in the native districts of Gutu and Victoria.

No. 336 of 1911]

[26th October, 1911

RABIES.

THE following instructions regarding the treatment of persons bitten by rabid animals are published for general information.

In every case where a person has been bitten by a dog or other animal known, or suspected, to be rabid the following precautions are recommended:

- (1) The wound should be immediately and thoroughly cauterized. This, if it does not altogether prevent the disease, delays its onset sufficiently for Pasteur treatment to be successfully applied.
- (2) The patient should be sent to Salisbury for treatment at once. Delays are dangerous.
- (3) The fullest information should be sent to the Health Department as to date when bitten, locality, fate of dog, and especially reasons for supposing the dog to be mad.

No. 338 of 1911.]

[26th October, 1911.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of Government Notice 45 of 1909 to be in force in the native district of Ndanga for a period of three months from date hereof.

No. 363 of 1911]

[30th November, 1911.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provision of section II of Government Notice No. 45 of 1909 to be in force in the native district of Victoria for a period of three months from the 11th November, 1911.

No. 365 of 1911.]

[30th November, 1911.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of clause II of Government Notice No. 45 of 1909 to be in force over an area within a radius of 15 miles of the Shamrock Mine, situated in the Gwelo district, for a period of six weeks from date of this notice.

Department of Posts and Telegraphs, Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.



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Editorial.

THE SOUTH AFRICAN AGRICULTURAL UNION CONGRESS was recently held at Bloemfontein. Rhodesia was represented by a strong contingent, consisting of Messrs. Eyles, M.L.C., Savory, Backhouse, Cripps, Laing and Shone, accompanied by the Director of Agriculture and Mr. Watt, Irrigation Engineer. The gathering consisted of leading farmers from all parts of British South Africa and the agenda was a most business-like one, carried through systematically and deliberately, so that the resolutions passed may be regarded as the true reflection of current public opinion on the questions raised.

The most important debate undoubtedly was that on the labour problem. It was shown that the difficulty was universal, and that while locally the causes of the dearth of labour might vary, yet throughout the length and breadth of the country, agricultural development is hampered and even ordinary farming operations restricted for want of labourers. The supply appears actually to be diminishing,

whilst the demand is constantly growing. Remedies suggested were many, some drastic, some gentle, but finally the consensus of opinion appears to be that no sudden or immediate improvement in the condition of affairs is likely, that, on the one hand, every opportunity and means must be taken to attract and encourage the agricultural labourer and, on the other, labour-saving methods must be introduced, replacing crude sinews and muscle by machinery and white men's brains. The present economic situation, however, in which a mass of potential labour is dormant and a vast section of the community reposes as an incubus on the body politic cannot continue. The farming industry, on which the life of the nation so intimately depends, must be maintained. The imperative need and importance of action, legislative or administrative, to this end was insisted upon, whilst anything of the nature of coercive measures or panic measures was equally strongly deprecated. Finally the views of the Congress were forwarded to Government in the following comprehensive resolution:—

That in the opinion of this meeting of the S.A. Agricultural Union immediate steps should be taken by Government to assist in adjusting the economic condition of the labour market within the Union, whereby the agricultural industry is at present greatly handicapped, and recommend action to be taken on the following lines:—

(1) Prohibition of labour recruiting in recognised farming areas.

(2) The prohibition of the collection of unemployed natives in localities other than native reserves or locations.

(3) The discouragement in every possible legal manner of the sale or lease in any form of land by Europeans to natives either as individuals or as communities.

(4) The dispersal of semi-idle natives who collect in municipal locations.

(5) The stringent enforcement of existing pass laws and the increase of the efficiency of and the penalties imposed under the Master and Servants Act (Cape). Passes only to be granted by or with written permission of the owner of the land upon which the native resides.

(6) The granting of rebate of a portion of the hut tax to all natives who have worked for not less than six months for Europeans, and an increase of the tax on all who have not so laboured.

(7) The employment of white labour wherever possible by Government, corporations, and individuals.

(8) The imposition of a heavy poll tax on all native boys and men used in domestic service.

(9) Laws shall be enacted and enforced in all native locations and mission stations for the preservation of the health conditions of the inhabitants thereof.

THE AGENDA.—Other matters besides labour on which discussion took place and recommendations submitted to Government were the control of the quality of seeds, fertilisers and farm foods sold to farmers, the eradication of noxious weeds, the destruction of vermin, fencing, re-organisation and extension of the work of the Union Department of Agriculture, co-operative creameries, pernicious scale, agricultural education, railway facilities and rates, classification of sheep at shows, branding, horse-breeding, inspection and grading of exports such as fruit and wattle bark, boring and other matters of local and general interest. This mere re-capitulation of subjects gives a good indication of the sphere and usefulness of the Congress, and even although many of the topics do not directly concern us, yet the presence of our delegates and their share in the debates was of great value to Rhodesia and to themselves, and was most warmly appreciated by the other members of the Congress.

The Rhodesian visitors availed themselves of opportunities to visit the agricultural experiment stations and stud farms at Potchefstroom, Tweespruit and Grootvlei, and the Bloemfontein sewage farm and abbatoirs, at all of which places much of interest was seen and hints received for application later on.

Certain delegates and the departmental officials also attended the Irrigation Congress and the Stud Book Association meetings held in Bloemfontein during the same week.

LEGISLATIVE COUNCIL.—The recent special session of the Legislative Council was fruitful so far as the farming industry is concerned mainly in the formulation of a working arrangement for the provision of labour which all hope may be successful.

An Ordinance was passed, on the initiative of Mr. Eyles, M.L.C., facilitating the operations of agricultural co-operative societies which it is anticipated will prove a benefit to the existing society and to others which may be formed. The Kafir Beer Ordinance also passed will not be without its good effect on the rural community in general.

IRRIGATION.—The Irrigation Ordinance, as introduced the previous session and laid before the public, was brought in, but after discussion held over till the forthcoming ordinary session. This step was taken on the representations of Mr. Eyles and the Director of Agriculture, who, along with the Irrigation Engineer, had attended the Irrigation Congress, held in November, at Bloemfontein. The main subject of discussion thereat was a proposed new law unifying those hitherto in operation in the various provinces, lately colonies. Most instructive and searching debates resulted and it was realised that in certain important directions modifications in our proposed law might advantageously be introduced. These were of such a nature that it would have been difficult to introduce them by amendments to the Draft Ordinance as published and that the better course would be to recast the whole, even though a delay till next session was thereby involved. It is hoped that by publishing the Ordinance in its new form at an early date ample opportunity will be given for its public discussion by those interested and that in the result a thoroughly useful practical workable law governing the all important question of the of the utilisation of water will be secured.

BACON FACTORY.—We would call attention to the announcement made of the intention of the British South Africa Company, without calling upon the farmers interested to contribute, to erect at Bulawayo, at an early date, a fully equipped bacon factory capable of dealing with five hundred

pigs per week. With this solution of the much discussed question of a factory, it only remains for all farmers interested to produce the necessary pigs in numbers and of a quality adequate for the purpose. There need be no fear for a long time of over production and should signs of such appear, the question, after one pioneer and experimental factory had proved a success of establishing others at suitable sites, would be a comparatively simple matter.

THE LAND BANK.—At the opening of the recent Legislative Council, in the course of the opening address, His Honour, the Administrator, said "I have much pleasure in informing you that the preparations for the establishment of a Land Bank have reached an advanced stage. The Articles of Association will shortly be registered in this territory and the services of a gentleman of wide South African experience have been secured as chairman. It is expected that the Bank will be in a position to commence operations at an early date."

IMPORTATION OF BULLS BY THE GOVERNMENT.—It is the intention of the Government to import a consignment of pure bred cattle from England for distribution on terms similar to those adopted last year. Particulars will be found in our Departmental Notices. In conformity with an undertaking made during the course of the recent session of the Legislative Council, it is proposed to procure a number of bulls, and, if desired, heifers; to inoculate these against redwater and gall-sickness, and then to distribute them at actual cost price to applicants on terms which can only be considered exceedingly favourable.

The main objects in making this announcement now is to ascertain approximately the number and breed that will be required, also, within limits, the ages and class. Requests can be considered only for Shorthorn, Hereford and Sussex cattle, bulls and heifers. The type imported last year were certainly splendid specimens and in very high condition. Only high-class stock are worth the additional heavy expenses of importation and inoculation, yet, it has been realised that in many instances a less superlative animal

would serve the purpose of improving native stock equally well and even better, provided it has unquestioned pedigree, breeding, trueness to type and constitution, that it has not been unduly forced, fattened and pampered in its upbringing and possesses in addition robust health, substance and a correctly proportioned frame free from structural faults of any kind.

The terms of sale are on the same lines as those of last year, with certain modifications, the outcome of last year's experience.

Priority of selection will be allowed in the order of application, so that those wishing the best choice should communicate at once with the Director of Agriculture. The consignment will arrive in the winter months.

VETERINARY STAFF.—In connection with certain reconstruction which has taken place in the Veterinary Department, necessary in view of the steadily increasing numbers of farmers and of their flocks and herds, Mr. Edmonds, of Bulawayo, has been appointed Assistant Chief Veterinary Surgeon as from 1st January, 1912, whilst the Territory has been divided for administrative purposes into regions each in the charge of a District Veterinary Surgeon, respectively, Mr. Hooper Sharpe, at Bulawayo; Mr. Ferguson, at Gwelo; Mr. Chatterley, at Umtali, and Mr. Williams, at Salisbury.

Further particulars will be found under the heading of Departmental Notices.

SCIENTIFIC STAFF.—The strength of the Department of Agriculture on its technical side has been augmented by the appointment of three assistants in the respective sections of Agriculture, Chemistry and Entomology. Mr. Walters comes from the Department of Agriculture, Pretoria, to replace Mr. Bruce Dickson, resigned. Mr. Holbrow takes up the appointment of assistant in the chemical laboratories, whilst Mr. Lowe Thompson is on his way out from England to assist Mr. R. Jack, the Entomologist.

The value of scientific research in agriculture is appreciated in Rhodesia, and the services of these experts will be welcomed in their respective spheres wherein they can be assured of ample scope and every opportunity for useful occupation.

EXPERIMENT FARM FOR MATABELELAND.—With a view to studying in a practical manner the farming problems of the granite areas of Rhodesia, an agricultural experiment farm has been established near Lochard Station on the main line between Bulawayo and Gwelo.

Granite soils are the chief type throughout the country, and it behoves us to find out as quickly and conclusively as possible the best uses to which they may be put. This can only be done by means of actual experiment and demonstration, and it is for this purpose that the farm has been selected. The ground is quite typical, not exceptional fertile, high lying and somewhat exposed, undulating and well watered, characteristic of a very great part of the country. It is proposed to cultivate the land and to try a large variety of crops, with the object of increasing the scope of arable farming on light soil, paying especial attention to the possibilities of winter cereals on naturally damp unirrigated land, to tobacco, ground nuts, fodder crops, and artificial pasture. The first stage is the trial of new plants in small plots, then the extension of such as show promise to larger areas, trying different methods of cultivation, seasons and treatment, finally testing such as succeed on a commercial scale, and demonstrating their value and uses. Necessarily several seasons must elapse before such an experiment station can be fully developed, and patience and perseverance must be exercised in conducting step by step the process of such experimentation. Meantime, however, visits by those interested will be welcomed, although for the first few months there will be little to see, for at the time of writing the farm is but bare veld, unfenced and uncultivated, save for a couple of native kraals. In time, too, it is intended to put stud stock on the farm.

CO-OPERATIVE EXPERIMENTS.—The Government Agriculturist and Botanist asks us to draw attention to the fact

that a certain amount of laxity in submitting reports on co-operative experiments has recently been evident. We would remind farmers that this system of experiments has for its object the benefitting of farmers throughout the whole country and in order that full use may be made of the knowledge gained by experimenters each year it is desirable the results should be published as soon as possible after the season's experiments are concluded.

Not more than fifty per cent of the farmers who received winter cereal seeds for experiment last year have yet reported their results, although the crops have been reaped several months. For this reason the article on Winter Cereal Crops appearing in this issue is by no means as complete as it should be and we would therefore earnestly ask farmers to give a little more thought to this matter and to forward their reports on experiments whether the results are favourable, unfavourable or negative, as soon as possible after the crops are reaped.

FREE SEED FOR TRIALS.—The Seed Distribution is divided into two seasons, namely summer and winter. The time for issuing seed lasts therefore from about September to December and from February to the end of April. Early application is advisable, but during the current season numbers of applications for seeds for summer sowing were received as late as the month of January. We would point out that this delay until the last moment not only adds considerably to the work connected with the despatch of seed but also leads to disappointment in more ways than one. Late in the season, supplies of many varieties are exhausted and applicants are frequently disappointed at not receiving the seeds applied for. On the other hand, with many crops planting after the middle of January can only lead to unfavourable results and experiments thus handicapped at the start are inconclusive and of small value. We would ask our readers to bear these facts in mind and to make application for the seeds they require as early as possible in the proper distributing season.

CONTRIBUTIONS.—We would call attention to two articles, each the first of a series kindly promised, dealing respectively

with poultry and bees. The pseudonym "Gallinule," covers modestly the identity of a recognised authority on all matters connected with the subject he discusses, whilst Mr. Sworder, who contributes the papers on apiculture, is well-known in this connection in the Transvaal.

An interesting article is furnished by Father Goetz, read before the recent Dry Farming Congress at Pretoria, on rainfall and evaporation. It will be continued in our next issue.

The important discussion of the cattle dipping question, by Lieut-Col. Watkins-Pitchford of the Union Veterinary Department, is completed.

CROWS.—The attention of those who suffer much damage from the depredation of crows during the planting season is drawn to a means of exterminating them given in this issue under "Laboratory Notes." The method, which can be strongly recommended, has been tried with very good results in New Zealand, and has proved equally successful in this country.

SAFCO.—The South African Fertilizer Co., Durban, again issue their handy little pocket diary to their friends, a useful companion and a reminder of the activity of this enterprising firm.

THE RHODESIA SCIENTIFIC ASSOCIATION'S GOLD MEDAL, recently offered for an original paper advancing the knowledge of the transmission of any insect or arachnid-borne disease affecting Rhodesia, has been awarded to Edward Hindle, Ph.D., A.R.C.S., F.L.S., Magdalene College, Cambridge, Beit Memorial Research Fellow, for his paper on "The Transmission of *Spirochæta Duttoni*." The paper was read at the meeting of the Landowners' and Farmers' Association, held on the 26th January, 1912.

It has been arranged that the next Agricultural Union Congress shall commence on Monday, 11th March, at Gwelo.

Lime Deposits in Rhodesia and their Value.

By G. N. BLACKSHAW, B.Sc., F.C.S.,
Government Agricultural Chemist.

Among a large number of limestones and travertines (vlei limes) received at the Agricultural Laboratory, Salisbury, from various part of the country; several, which occur within reach of a market, have proved to be of very good quality, and will yield 'burnt limes' highly suitable for mining, building and agricultural purposes, yet we find on referring to the latest trade returns published for this territory, that during the year 1909 over 500 tons of lime were imported, and that this amount was more than doubled in 1910. This ought not to be the case, for lime formations occur within our borders which can yield a product of really good quality, abundant in quantity, and suitable in all respects for the requirements of the country.

The bulk of the imported lime has doubtless been used on the mines, but, with efficient burning, there should be no difficulty in producing locally a lime for 'cyaniding' purposes which will rival the imported article, and more than satisfy the standard fixed for the material by the mines of the Rand.

In the past, the fault with Rhodesian 'burnt limes' examined in the Laboratory has been the incomplete burning of the raw material or prolonged exposure of the burnt product to atmospheric action, whereby the lime has in part reverted to the form in which it existed before it was placed in the kiln. More attention is now being paid to the process of burning, consequently it is probable that the fault referred to will be met with less frequently, and so soon as the consumer is confident that this defect no longer exists, some of our limes should assuredly meet with greater favour among the mining community.

In regard to the limestones occurring in the country, it is scarcely necessary to mention that they vary greatly in quality ; a few there are which possess a high degree of purity. whilst others are either 'dolomitic,' containing a considerable quantity of magnesia which renders them unsuitable for agricultural, mining and ordinary building purposes, or contain too large a proportion of silica and refractory silicates for the production of high grade 'burnt lime.'

COMPOSITION OF RHODESIAN LIMESTONES.

Lab. No.	Locality District.	Silica and refractory silicates.	Iron, Oxide and Alumina.	Calcium Carbonate.	Magnesium Carbonate.
	L	%	%	%	%
5.	Gwanda ...	10.90	—	83.95	—
16a.	Salisbury ...	0.64	0.61*	96.37	0.62
14a.	Salisbury ...	5.75	0.92	90.73	1.26
226.	Bulawayo ...	12.17	0.76	83.60	3.47
8.	Lomagundi ...	—	—	54.23	43.26
210.	Hartley ...	4.37	0.21	50.85	44.58

No. 5. Should. on burning, produce a fairly good building, cyaniding and agricultural lime.

No. 16a. Was one of several submitted from the Enterprise district, 20 miles distant from Salisbury ; it is a highly crystalline limestone of particularly good quality, and will produce a first-class white lime. Regarding the extent of the deposit I have no information, but that more than one variety of limestone is present in the vicinity is indicated by the fact that another sample from the same locality was 'dolomitic' in character, possessing a large proportion of magnesium carbonate.

No. 14a. This sample was selected from the rubble about to be introduced into the kiln ; there is evidence that

* Contains Ferrous Carbonate 2.05%.

nate (carbonate of lime) present, owing to the presence of ironstone in the vicinity. With careful selection of the material, however, it is probable that lime of good quality can be obtained.

No. 226. Owing to the proportion of silica and substances other than calcium carbonate being somewhat high, this limestone cannot be classed as one of first quality. If well burnt, the material will produce a fairly good lime for building, agricultural and cyaniding purposes.

No. 8, which is a dolomitic limestone, was obtained from the Sinoia caves; the magnesia content is too high for ordinary building, cyaniding and agricultural purposes; it has, however, been shewn that dolomites yield a lime which has the property of forming hydraulic mortar.

No. 210. *Vide* remarks on No. 8.

A very common form of lime deposit met with in this territory wherever epidiorite, basalt, dolerite, serpentine and other basic rocks abound, is that known as travertine, or as it is more commonly designated, vlei lime. The latter name has come into use owing to the fact that it is generally found in vleis at or near the surface. In the Mazoe Valley, where it occurs in large quantity, I am told that the deposits are ten feet or more in depth. Much thicker deposits have, however, been located. In the district of Wankie, for example, a shaft which has been sunk to a depth of 60 feet, passes through vlei lime entirely, except for a few feet of soil upon the surface.

Vlei limes have most probably originated from the weathering of the surrounding basic rocks which contain a considerable quantity of lime in combination; the action of the weathering agents being to gradually dissolve out the lime in the form of carbonate, the solution gravitating to the vleis where the carbonate of lime is deposited on evaporation.

The feature which has made itself manifest in those vlei limes already examined in the laboratory is their uniformity in composition. There is naturally a certain amount of

the material varies somewhat in the amount of calcium carbonate, but the range is comparatively small as will be seen in the following table :—

COMPOSITION OF SOME RHODESIAN TRAVERTINES
(VLEI LIMES).

	Mazoe, average of 9 samples.	Gwelo.	Kimberley Reefs.
	%	%	%
Organic matter and water of combination ...	3'06	2'00	2'47
Silica and refractory silicates	4'79	0'90	1'26
Iron oxide and alumina ...	—	0'46	0'45
Calcium carbonate ...	89'50	95'00	94'39
Magnesium carbonate ...	2'85	1'56	0'82
Total loss on ignition ...	43'93	44'65	44'39

The lowest content of calcium carbonate recorded in the samples drawn from the Mazoe Valley was 84'07%, and the highest 93'62%. If the material is *completely* burnt, the average of the Mazoe vlel limes examined would yield a slaked lime containing 70% of calcium oxide, whilst the Gwelo and Kimberley Reefs samples would under similar conditions produce slaked lime containing 73% calcium oxide. These figures compare very favourably with those quoted for imported lime.

For information in regard to the value of lime for agricultural purposes, reference can be made to an article entitled "The Use of Lime in Agriculture," which appeared in the December, 1910, issue of this Journal. A copy of the article can be obtained on application to the Department of Agriculture.

Rainfall in Relation to Dry Farming.

By the Rev. E. GOETZ, S.J.
(Director of the Bulawayo Observatory).

*A Paper read at the Dry Farming Congress, Pretoria,
November, 1911.*

The part of the United States of America where dry farming is to-day practised on a large scale extends roughly from the central meridian to the Pacific Coast. This represents an area larger than the whole of Africa, south of the Zambesi. On the whole this area receives, on an average, less than 20 inches of rain in the year. The line of the 20-inch normal rainfall runs along the 100th meridian; the line of the 15-inch rainfall along the 105th meridian. There are a few regions of higher rainfall in this area, and a narrow border along the Pacific, from Vancouver to San Francisco, has a very heavy rainfall.

Dry farming has been taken up, especially in Colorado, Wyoming and Utahs.

In South Africa there is the large region south of the Orange River and extending from the Atlantic to Kaffraria, which has many points of resemblance with these American States.

In Matabeleland the rainfall ranges from 20 to 25 inches on average according to districts, with extremes of 40 inches one way and 15 inches the other. Going south towards the Limpopo Valley it ranges from 15 to 20 inches. In the Western Transvaal it goes from 20 to 25 inches. Bechuana-land averages 20 inches. This average gets lower as we go west to the less inhabited parts. In the Free State we have the returns of a few stations only, that give an average of about 22 inches, this gets lower as we go west, at Kimberley it is 19 inches only. In the whole of this area yearly rain-falls of less than 15 inches are rare. The lowest in Bulawayo

has been 17 inches, 17 inches also in Mafeking, 21 inches in Johannesburg, 18 inches in Pretoria. The Limpopo Valley is decidedly drier, at Tuli the rainfall has been as low as 12 inches. In the south-west low rainfalls occur also. The Kimberley records give a year with 9 inches only. All other years were above 12 inches. It must be noted, however, that in earlier records we find a trace of years of extremely low rainfall. Moffat mentions five years of continuous drought in the south-west from 1821 to 1826. One year gave only one shower. Livingstone mentions five years of continuous drought at Kolberg in the Mafeking region, from 1844 to '49, He told Balwin, the hunter, that during those years it practically never rained. Nothing like this has happened since regular records have been kept. In the whole of the area 90% of the rain falls during the growing season. In Matabeleland the rains of the dry season are not more than 5% of the yearly fall.

As far as the rainfall is concerned, we are therefore in these parts of South Africa far better off than they are in the dry lands of America. On the whole we may say that during the growing season our rainfall is double of theirs. Yet, if we compare our agricultural returns with theirs, we must confess that they are more successful than we are. There are in our climate several features that are against us. The first is the long and dry winter. It is a well known fact that, in temperate zones at least, a dry winter is generally followed by a poor summer crop. We have every year this disadvantage, with the further drawback that the spring is generally the hottest and driest part of the year, so that farming operations cannot be very active before December. Unless proper precautions have been taken, a great part of the rains falling on a soil that has had no rain for nearly seven months in the north and nearly six in the south, is lost through run-off and evaporation. The evaporation during the three months of September, October and November, represents 35% of the year's evaporation in Bulawayo and 30 per cent. in Johannesburg.

The most important difference, however, is to be found in the vastly different temperature conditions. One of the main principles to go upon in the study of the relation between climate and crops is that, all other things

such as soil, seed, etc. being equal, the life of a plant and consequently the crops depend on two factors, moisture and heat, in such a way, that if one be in excess the other shall be the controlling factor, that is where heat is in excess, or simply abundant, moisture will control the crops.

These temperature conditions are therefore such that we cannot afford to lose much of our available moisture and every precaution should be taken to preserve for our crops as much of our rainfall as we can.

American experts generally admit that half the yearly rainfall is lost to agriculture in the Western States. I do not think that this proportion is too high in our case, I rather think it is too low. The three causes of deperdition after rainfall are percolation, run-off and evaporation.

Experiments made in various places in England on the amount of rainfall that percolates through three feet of various soils, gave from 10 to 16 inches or from 30 to 50 per cent. of the rainfall, according to the nature of the soil and the amount of rainfall. This amount is not of course wholly lost to agriculture as all of it does not find its way below the useful level, and as part of it is brought up again by capillarity from lower levels under certain circumstances. Besides, the flow of the streams in the neighbourhood of the percolator gauges show distinctly that the water drained through the land was less than was indicated by the gauges. But the final amount represented in any case a notable proportion of the rainfall. It is evident from the scarcity of springs, the absence of perennial streams, the movement of the water in the wells, as well as from the geological formation, that the amount lost by percolation cannot be very great in the hinterland of South Africa in which settlements occur.

The loss from the run-off is, however, a different matter. We may safely assume that from this cause we lose annually a large percentage of our rainfall. Prof. A. J. Henry, in a memoir on the rainfall of the United States, America, states that in extreme cases probably 95 per cent. of the rain which falls in heavy downpour is carried away to the rivers. In Bulawayo, a discussion of the rainfall, hour by hour, for three years, showed that exactly one-fourth of the rain

had fallen at the rate of 1'70 inch per hour. This, from what I have seen of South Africa, may be taken as typical of the whole sub-continent. It is difficult to estimate what proportion of these heavy falls penetrate the soil in ploughed lands. But we may safely state that the proportion is not very large. When the rain comes down with such force it quickly saturates a thin layer of the surface soil, this saturated layer acts as an impermeable layer for the ground below. The water falling on this saturated strip is unable to percolate down as rapidly as it falls and runs off more or less rapidly, according to the slope. A very small slope is sufficient to start a run-off, as all those who have tried irrigation on a large scale well know. A slope of 1 in 10,000 is sufficient to set a stream running, and some of the large rivers, as the Mississippi below St. Louis, have a slope of 1 in 20,000. It is of course difficult to estimate with sufficient accuracy the loss of rainfall from these two causes, percolation and run-off.

Sir J. Murray, from the study of the discharge of 33 of the large river basins in the world, shows that from 20 to 25 per cent. of the yearly rainfall goes back to the sea through percolation and run-off. Hydraulic engineers in England generally admit that one-third of the rain falling on cultivated lands is available for waterworks. Belgraid, in France, from the study of the discharge of the rivers, concludes that 43 per cent. of the annual rainfall is carried away to the sea. This percentage is very high considering that 82 per cent. of the country is under cultivation. If therefore we admit that 30 per cent. of our rainfall is lost to agriculture through percolation and run-off on cultivated lands, I think that we are not in any way exaggerating.

Before passing to the discussion of evaporation we may write off at once nearly the whole of the rains that come as winter rains or light rains, *i.e.*, rains of less than 0.10 per day. They represent about 15 per cent. of the yearly fall. That the winter rains are generally useless for soil moisture is evident from the consideration of the duration of the dry season and the average rainfall during the season.

That rains of less than 0.10 in a day are of little use is shown by Haberlandt's experiments on the time taken by rain of various intensities to evaporate. He shows that from tubes

filled with earth and receiving water equivalent to 0.10 of rain, evaporation takes off 95 per cent. in one day and 5 per cent. on the next. From these considerations we may say that as minimum we lose 40 per cent. of our rains from percolation, run-off, and from the way or time of the year in which they fall.

The remaining 60 per cent. *i.e.*, from 10 to 15 inches according to districts have to be distributed between the consumption by plants and the evaporation from the soil. If this percentage of 60 could be all preserved it would be amply sufficient to raise crops and even very good crops. The figures given by experts for the amount of water crops consume in a year vary from 7 to 14 or 15 inches. Gilbert and Lawes, from experiments made at Rothamsted, in England, give 7 to 8 inches. King and Hillyard, in Western America, 7 inches. Risler, from laboratory experiments and observations on the drainage of cultivated fields in the South of France, gives 10 inches. Wollny, in Central Europe, 10 to 14 inches, according to crops. Marié-Davy, from a set of twelve experiments carried on for two years at the Montsouris Observatory in Paris, in tubs planted with wheat, gives 14 to 15 inches. These numbers differ because it is evidently not possible to make experiments or field observations in identical conditions, several factors besides moisture, such as the nature of the soil, use of fertilizers, sunshine and heat, nature of plant and seed, have to be taken into account. One thing, however, shown by Marié-Davy's experiments, both in tubs and free earth, is that by keeping plants liberally supplied with moisture, the crops not only do not suffer but are vastly improved in quantity and quality. Plants are injured in very wet seasons not so much by excess of moisture as by diminution of sunshine. The crops harvested by Marié-Davy, in both years, were much superior to those harvested in the Rothamsted experiments, where the water consumption was smaller by half. We have therefore every reason to try and check the evaporation from the soil which tends to diminish to a notable degree the percentage of available moisture.

It is very difficult to get even an approximate idea of the loss by evaporation from the ground. Evaporation depends mainly on three factors, the wind, the

temperature of the evaporating surface and the dryness of the air. We know by experience that the South African hinterland is seldom free from wind. In Bulawayo the analysis of the continuous wind records show that on an average we have not more than two to three hours of calm weather per day, and a large proportion of those hours of calm occur during the night, when, owing to lower temperatures and higher humidity of the air, evaporation is less.

The temperature of the evaporating surface is really the cause that promotes evaporation, and the higher this temperature the more rapid the evaporation, everything else being, of course, equal. We have few observations in South Africa on the temperature of the surface soil. This, of course, depends on the nature of the soil and its state of humidity or dryness. In any case it is very great.

In a discussion of a series of experiments on evaporation made at Kenilworth Observatory, Kimberley, Dr. Sutton showed that the state of dryness of the air is a most important factor in evaporation, from surfaces exposed in free air. The dryness of the air is gauged by what we call the "Relative Humidity" of the air. The air at a given temperature can contain up to a certain amount of moisture. When this amount is reached the air is saturated and condensation takes place in the shape of fog, mist, rain, or dew. As long as there is no condensation the amount of invisible water in the air, is lower than the amount it could contain at saturation. Observations are made daily in meteorological stations, from which we deduce what percentage of the amount necessary to saturate the air at the temperature of the observation, is actually in the air. This percentage is called "Relative Humidity." When this percentage is low the air is relatively dry, it has a large capacity for absorbing moisture, it is in fact thirsty air. At Kimberley in the year 1901, the mean daily relative humidity was 54%, and this mean remained for every month between 69 and 41. At Bulawayo the mean relative humidity at 8 a.m. is 64. The recording instruments show that with very few exceptions the humidity remains lower than this for about 15 hours daily. At certain periods of the year it goes for several hours in the day very low indeed. During September of this year for instance, it went on 12 days to 10 per cent. or below for from 4 to 10 hours on

these days. We must therefore conclude that the causes which promote evaporation are very active in Rhodesia. Direct measurements of evaporation are on the whole unreliable. They give us a general idea of the rate of evaporation rather than an exact measurement of the amount actually evaporated from free land or water surfaces. There are three series of measurements in the drylands of South Africa, those of Kimberley and Johannesburg, which are directly comparable as they are made with gauges of the same kind (6ft. tanks), and those of Bulawayo, made with an 8-in. gauge, but which can be compared to the others by means of Dr. Sutton's simultaneous observations with gauges of both descriptions. The evaporation from water surfaces is, according to these measurements, 60 inches in Kimberley per year, 78 inches in Johannesburg, and probably something over 80 inches in Bulawayo.

These results, compared with those obtained from similar gauges in Europe or the Eastern States of America, show that the evaporation in the drylands of South Africa is from two to five times larger than it is in various parts of the temperate zones, whatever the actual amount from the land or large water surfaces may be.

Risler, from a series of laboratory experiments and field observations, deduced the average daily consumption of water by various plants during their time of growth. For maize, for instance, he gives from 0'11 to 0'16 of an inch. Taking the lowest of these figures we see that half an inch of rain would benefit a crop for only about two days—one inch for four days, if the evaporation from the ground is free, instead of four and nine days respectively if the evaporation from the ground were checked.

These figures, of course, must only be taken as an indication, for the shade of the plants after a time will protect the soil, to only a limited extent, however, according to the more recent methods of planting. But if the methods given further on for checking evaporation be neglected, it is probable that the fields will not be clean and that the transpiration from useless weeds and grasses will even be larger than from the maize plants.

(To be continued.)

Storage and Handling of Grain (Maize).

Extracts from the Report of SIR THOMAS PRICE, K.C.M.G.

Through the courtesy of the Government of the Union of South Africa, copies have been received of Sir Thomas Price's admirable Report on the Storage and Handling of Grain. It will be remembered that Sir Thomas was deputed by the Union Government to visit Europe, the United States of America and Canada, in order to enquire into the methods of grain export, with a view to making recommendations whereby the conditions of shipment of maize from South Africa might be improved. The Report is a most valuable document, and may be said to be the last word on a subject of which up to the present, comparatively little has been known in South Africa. As is to be expected, a great part of the matter dealt with is not of such direct interest to the grower, and the following extracts have therefore been made of some of the points of more vital importance to Rhodesian farmers.

The writer deals extensively with the quality of the maize produced in the Union of South Africa, and in this connection it is of interest to recall the several trade reports which have been published in this journal, dealing with the quality of Rhodesian maize. The gist of these has been that Rhodesian maize, if anything, is of somewhat higher quality than that grown in the Southern Provinces, and this to a certain extent counterbalances the increased disadvantages under which the Rhodesian grower labours. The Report confirms the advice already tendered to Rhodesian farmers, that where possible, the grower should aim at producing prime quality white maize, and that there is very little danger of an over-production of this type ever placing the white maize in a less favourable position than the yellow where an export trade is concerned.

The recommendations regarding the obligations of the Railway Administration to take steps to lessen transport

charges on maize, carry additional weight when coming from a late General Manager of the South African Railways, and it is to be hoped that these recommendations will be favourably received not only by the South African Railways but also by the Rhodesian Railways and the Shipping Companies concerned.

We fear that the question of bulk handling of grain as opposed to bagging is an ideal to be aimed at, but not immediately feasible, at least, as far as Rhodesia is concerned, and meanwhile a combined reduction on freight charges by both the Railways and the Shipping Companies would do much to encourage production, and at the same time increase the carrying trade.

The table showing the production of the United States of America and the comparatively insignificant proportion of maize available for export is a striking indication of the extent to which home-feeding is practical in America since the amount exported, in comparison with the total production, is governed to a great extent by the profit at which the grain can be converted into animal and manufactured products.

It is to be regretted that during the last twelve months when the price of maize on European markets has been particularly good, the South African crops have been light, and there has been a falling off in the export trade. Had South African maize been forthcoming to fill the shortage, it would have established itself as a factor to be considered in the law of supply and demand. Still more unfortunate is it that, from all reports, the present year's output is likely to show a decrease on that of 1911.

The first question dealt with is the quality of, and demand for, South African maize and the finding should set at rest, once and for all, any doubts that may have been entertained regarding the potentialities of the maize export trade.

The following are extracts from the report:—

Can South Africa grow Maize and possibly other products of the soil of the Quality and Quantity required Oversea.

The practical experience of the past four years enables an unhesitating affirmative answer to be given as to the quality

being suitable, while the large tracts of uncultivated land throughout South Africa capable of growing maize, and the example of the United States and Canada, with a yet more unpromising outlook at the beginning, supply an equally emphatic affirmative answer as to quantity.

It was pleasant to hear the uniform testimony in every country visited—Great Britain, Belgium, Holland, Germany, France (and indirectly Italy)—as to the excellence, as a rule, of South African maize, in comparison with the maize received from other countries.

While all the descriptions of South African maize were spoken of appreciatively, the flat white maize of good quality was specially referred to, the reasons given being that it can be put to superior uses, and is not readily obtainable from elsewhere. The supply other than from South Africa comes chiefly from the United States. The latter is not of quite such good quality, and is decreasing in quantity because of the increased demand for it in the United States itself.

I was assured that from ten to twenty times the quantity, and even more, that South Africa at present exports, would find a ready market; indeed, the impression was created that South Africa could, if it made the effort and maintained the quality, command practically the whole of the markets in Northern Europe and in Great Britain for this class of maize, *i.e.*, the flat white maize. The benefit of such a result, in the way of maintaining satisfactory prices is obvious.

The advantages which the South African maize producer possesses, that call for special mention, are:—

- (a) The good quality that can be grown.
- (b) The good climate and the maize being sun-dried.
- (c) The low percentage of moisture.
- (d) The good reputation, established by careful and impartial Government grading and granting of certificates.

The wisdom of the action taken by the Government in this respect is fully justified by results; and is regarded with much favour in the European markets.

(e) Realizing, usually, the highest prices ruling for maize of the respective descriptions in the European markets.

(f) Less cost of land.

The land available for cultivation fairly adjacent to railways, either in existence or in prospect, is as a rule, less in price at present than corresponding land in the United States and in Canada.

(g) Preference for colonial maize.

Great Britain receives from 40 to 45 per cent. of the maize imported into northern Europe, as will be gathered from the details furnished in this Report. It was evident from the very marked approval with which the observation was received at a meeting with a large number of representatives of the London Corn Trade that, all other things being equal, Great Britain would prefer to receive the bulk of its maize supply from a country within the Empire.

The disadvantages the South African grower labours under are :-

(a) Higher rate of ocean freight.

(b) Frequent inadequacy of shipping facilities at the time the maize requires to be despatched.

This is made a strong complaint by shippers, but the steamship lines contend that the difficulty is brought about by the shippers themselves, owing to the want of proper arrangement and organization. However, whatever the cause, the result is the same and calls for redress.

(c) Want of facilities for storage and handling at country and at terminal depôts pending disposal on favourable terms.

(d) Conveyance in bags resulting in its receipt in Europe in a form not so generally acceptable, higher costs and greater time occupied in discharging, apart from cost of the bags.

To serve the means of furthering the purpose this consideration suggests, it is necessary, before deciding upon the expenditure which the Railway Administration should incur, and the character of the buildings, appliances, and other

requirements to be provided for the purpose of developing an export trade on a much larger scale than at present obtains, as well as to facilitate the handling and minimize the cost of transport of the internal trade, to enquire at the outset as to :-

- (a) The extent, permanence and probable expansion or contraction of the markets available overseas for purchasing the maize or other products at prices that will yield a return to the farmer, as producer, after payment of the transport and other necessary charges, even though the profit be small.
- (b) The probable effect of largely increased production and export, on the prices obtainable for the maize.
- (c) The other maize-producing areas of the world supplying the same overseas markets with which South Africa will enter into competition, and the prospects of new areas coming into competition as well as the probable expansion, or the reverse, of the existing maize-producing areas in parts of the world other than South Africa.
- (d) The amount paid for transport and other services necessary to be incurred and the measures, if any, that can be taken to reduce, or possibly to eliminate some of the charges, so as to make the growing of maize for export more remunerative, and therefore more attractive to the producer.
- (e) Generally, the best settled policy to pursue.

Maize is constantly being put to new uses. Its use in various new as well as old forms as articles of diet is greatly on the increase, and the demand for maize in northern Europe and Great Britain is correspondingly growing year by year. Throughout the recent enquires in those areas the one criticism offered about South African maize was, that it was available in such small quantities: the assurance was given that if it could be supplied in many times the quantity it is at present it would be readily absorbed without prejudicially affecting prices. The testimony throughout Europe

and in Great Britain was uniform in this respect: also, that the demand for oversea maize will continue to increase. One leading buyer stated his constant difficulty was to get a sufficient tonnage of our maize at a time to fulfil orders. He instanced a recent experience when he had to go to quite a number of sellers to get together 800 tons from South Africa, whereas if his orders had been for South American maize he could have purchased eight to ten full steamer cargoes in a shorter time and with less difficulty. The tonnage South Africa exports up to now, considerable though it is from a South African point of view (and highly promising, as all were agreed in America, Great Britain, and Europe, when remembering the short period since a serious attempt at exporting was first commenced), is small compared with what South America and the United States grow and export. In the year 1908 South America grew 3,779,361 tons, and exported 1,871,965 tons; and the United States grew 74,129,194 tons and exported 1,046,251 tons.

There is no reason to expect that the requirements of Great Britain and Europe for oversea maize, will diminish for generations to come, while all past experience points to the importation probably increasing. There need be no misgiving, therefore, as to South Africa not being able to find a sale for any quantity of maize it can export after satisfying internal requirements (and those of places in the vicinity of South Africa) so long as it can hold its own in competition, or of such quantity so flooding the markets as to depress prices.

The markets in Europe to which it seems advisable for South Africa to confine its attention chiefly, at all events for the present, are:—United Kingdom, Belgium, Denmark, France, Holland, Germany, Norway, Sweden, Switzerland.

The United States grows between four and five times as much maize as the rest of the world (excluding Asia, the figures, for which are not available, and probably are not, in any case, important). Its yield is increasing year by year, but not so fast as its internal demands, with the result that the export tonnage is getting less and less in weight and in percentage. This is becoming so apparent, that I was informed in Europe and also in Great Britain, that the

United States is no longer regarded as a reliable source of supply, and is expected to cease altogether before long. This conclusion was confirmed by what was stated to me in various parts of the United States where I found the feeling prevalent in well-informed quarters that at the present and prospective rate of increase in local requirements it is not unlikely that in ten or twelve years hence the United States will be importing maize in considerable quantities to meet local needs. In that event it seems likely the bulk of such imports will come from South America, though some from South Africa may be welcomed.

In this connection the following figures are of interest :—

WORLD'S MAIZE CROPS.

During the year 1908 the total maize grown throughout the civilized world (excluding Asia, the figures for which are not available) was 96,620,220 tons

Of this total there was grown in the—

United States	...	...	74,129,194 tons
Remainder of North America	...	...	2,579,666 „
South America	...	...	3,983,361 „
Europe	...	...	14,651,389 „
Africa (chiefly in Egypt)	..	...	1,029,194 „
Australasia (including New Zealand)			247,416 „

96,620,220 tons

The value of the maize crop reaped in the United States in the year 1908 was about £336,000,000, and in 1909 about £344,000,000. (The reason for the lower value in 1909 as compared with the larger measure in yield, was the fall in the price of maize in the United States in the latter year.)

And yet the whole of this maize growth and trade has been created within what is the life of many men. Indeed, it is virtually the result of less than sixty years of effort.

The following table gives the—

Total Production of Maize in the U.S.A. and Quantity (and Percentage) Exported for Twenty Years—1891 to 1910.

Year.	Production (in tons—2,000 lbs.)	Quantity Exported (in tons—2,000 lbs.)	Percentage Exported.
1891	57,226,500	2,127,841	3·7
1892	45,235,111	1,308,941	2·9
1893	44,986,000	1,846,931	4·1
*1894	33,688,055	794,039	2·4
1895	59,753,861	2,808,343	4·7
1896	63,440,972	4,967,150	7·8
1897	52,860,222	5,890,431	11·1
1898	53,449,583	4,923,751	9·2
1899	57,726,222	5,920,094	10·3
1900	58,475,083	5,039,040	8·6
*1901	42,292,222	778,574	1·8
1902	70,101,333	2,128,868	3·0
1903	62,338,250	1,617,279	2·6
1904	68,541,472	2,508,152	3·7
1905	75,222,055	3,336,384	4·4
1906	81,317,111	2,399,117	3·0
1907	72,008,944	1,529,551	2·1
1908	74,129,194	1,046,251	1·4
1909	77,010,444	1,005,712	1·3
1910	86,825,261	1,022,288	1·2

It must be remembered that the foregoing export tonnage includes exports to Canada, Mexico, and places in America, North and South, and islands adjacent. It is well, on the other hand, not to overlook that should a crop in one season be exceptionally abundant in the United States, the quantity that might be found available to export on such an immense output would be large. While there may be on rare occasions such a disturbing factor, the contingency should of itself not deter South Africa from proceeding with developments on a scale that will greatly increase overseas shipments. When such occasions arise would be the time to bring home the lesson that had to be learnt from somewhat similar causes in the United States, viz., the value

* The crops in 1894 and 1901 were, as will be noticed, partial failures, hence the low exports.

of raising hogs and other profitable stock to be fattened by the available maize, as well as the manufacturing of foodstuffs and other products out of the maize to a greater extent in South Africa, and exporting the same in an attractive form instead of sending the maize elsewhere to be so treated.

It may be said, and with considerable force, that the South African farmer is making good progress in competition as things are. Such is the case, but the South African producer would feel greater encouragement to grow more grain if he derived the benefit of the additional 1s. 1½d. per bag which now goes in payment for the bag and the disabilities at the ports of discharge, besides being relieved of the other disadvantages referred to. It has also to be remembered that the price of maize is subject to fluctuation, and it should be the aim to enable the South African farmer to compete when prices are depressed. The producer may fairly claim from his Government (apart from the benefit to the country by way of increased development and additional money put into circulation) the adoption of measures that will relieve him from these hindrances.

SUMMARY.

It will be seen from the foregoing that as a result of the inquiries entrusted to me, the following conclusions have been reached :—

- (1) The maize exported from South Africa compares favourably with that received from all other sources.
- (2) That, given suitable transport facilities, South Africa is capable of producing maize largely in excess of any tonnage exported so far, and that such maize will be readily disposed of in British and European markets without prejudicially affecting prices as the result of such increased export.
- (3) That the permanence of the markets in Great Britain and on the Continent of Europe, which it should be made possible for the South African producer to supply a fair share of their requirements, is assured,

and that requirements of such markets are likely to increase rather than decrease.

Further, that in Great Britain such South African maize will, other things being equal, be more welcome, as coming from within the Empire.

- (4) That the South African producer possesses certain advantages over his competitors, but also labours under certain disadvantages.
- (5) The chief of these disadvantages is the further distance from the competing markets and the absence of cheap lake and river transport available in other countries exporting maize.
- (6) That this disadvantage is further accentuated by the additional expense incurred by conveying the maize by railway and by ocean freight in bags instead of in bulk.
- (7) That apart from the cost of bags, extra cost of handling and delay in loading and unloading the maize in bulk occupies less space than maize in bags, a saving in carrying freight which the producer may reasonably expect to receive the benefit of.
- (8) That the above disadvantages reduce the net amount the South African producer obtains for his maize.

The product, though abundant in quantity, is of low value, the competition is keen and likely to become keener as time passes. Every penny per 100 lb. that can be saved in transport charges becomes of the greater value, in that it assists the producer in his competition, and gives him encouragement to persevere in increasing his output.

It therefore becomes incumbent upon all the transport authorities to assist to their utmost the achievements of this end, in their own interest by way of added trade and with the view to the development of the country.

- (9) That one means of assisting will be the adoption of bulk loading on the railways and on the ocean, with the provision of facilities of the description which experience elsewhere has shown to be the most suitable and economical; and that this is practicable in South Africa, and between South Africa and the Continent of Europe, has been proved by long experience in other countries and by other people. Such appliances and methods have been found to be not only desirable, but necessary, in the United States and Canada, which produce and handle the largest tonnage of grain in the world.
- (10) That the provision necessary to enable grain to be handled in bulk, should be undertaken and also operated by the Railway Administration, but that facilities should be accorded to companies or firms desiring them to erect buildings, provide appliances, and to operate same, at railway stations, and at other convenient sites.
- (11) That consignors desiring to use bags for the conveyance of their grain should be free to do so, but consignors adopting the bulk system should receive the benefit, in reduced charges, of the savings effected on land and sea.
- (12) That while as little disturbance as practicable should be made in respect of the transport of maize in internal trade, until the necessity therefor presents itself, rigid examination, grading, cleaning, weighing (and where necessary drying), of maize for export, by independent Government officers should be enforced.

Utility Poultry Keeping for Amateurs and Beginners.

By "GALLINULE."

I.—THE OCCUPATION AND ITS REQUIREMENTS.

In no branch of live-stock farming are the profits so high in proportion to the capital invested or the returns so quick as in poultry farming.

So great, indeed, is the discrepancy between outlay and return, that a certain school of agricultural theorists is for ever preaching the necessity of encouraging the industry and continually disseminating literature, that would lead one to suppose, that the possession of a few hundred fowls is all that is necessary to lay the foundation of a colossal fortune. Such contentions disprove themselves. As long as competition remains the soul of commerce, as long as supply and demand rule the markets of the world, so long will relatively high profits remain an unmistakeable evidence either of great risks to be incurred or of an unusually high degree of skill or capacity which the venture demands. Now, it is certain, that poultry-keeping does not require an enormous outlay of capital and that the risks are in no sense commensurate to the profits in view, and these facts these poultry theorists clearly recognise. What they fail to see, however, is that poultry farming operations cannot be carried on except upon a somewhat restricted scale and that the skill and business capacity of the successful poultryman are quite out of proportion to, and enormously in excess of any profits which he may hope to gain. Good poultrymen are few and far between and though technical education can do and has done a great deal for the advancement of the industry, there are limits and very narrow limits too, to the number of people, who, whether technically educated or not, are capable of carrying on the business with a fair measure of success.

If it were otherwise, production would have increased far more than it has done of late years and there would have been a considerable fall in prices. Of course, Rhodesian production has so increased and prices have so fallen, but it would be unwise to generalise upon the insufficient data provided by our necessarily restricted local trade. Prices, in general, have not fallen and show, if anything, a rising tendency. Even our own restricted Rhodesian market is insufficiently supplied with both eggs and table poultry, and that to such a degree, that thousands of pounds go out of the country annually for the purchase of poultry produce. There are reasons for this, other than lack of interest and want of knowledge, errors and negligences, which are not recognised and may perhaps await removal for many years to come. Of these latter the chief is want of organisation in the industry; while next in importance comes paucity of good poultry studs.

Poultry-keeping bristles with difficulties of such a nature that they can only be overcome by specialization and division of labour. The farmer, to make poultry pay, must keep a large stock; a large stock is a natural obstacle to careful breeding. Without the greatest care in breeding poultry degenerates quickly. It is useless to attempt, by the introduction of fresh blood only, to prevent this gradual falling off in quality and egg returns and however careful the farmer may be, however great his knowledge and skill, he must either neglect other departments of his business, or acquiesce in this degeneration. Selective breeding requires time and attention, which the general farmer is unable to devote to it. In America where poultry raising is carried on upon a huge scale, farmers do not attempt to raise their own breeding stock, but obtain them from breeders of repute and renew their breeding pens at least triennially, never hatching eggs from birds of the second generation of their own raising. Of course, I refer here to those who specialise in egg production, but even those, who devote themselves to the rearing of table poultry are by no means fond of breeding too long from stock of their own raising. In Rhodesia, however, the breeder is almost totally neglected by the farmer, who seldom has recourse to him after obtaining his original stock. This, it is needless to point out, is bad economy; but our

peculiar conditions often impose bad economy upon our farmers.

I doubt, if we have ten really skilled professional breeders in South Africa; there are two or three, I know; but the bulk of the advertising poultry vendors seems to regard the mere fact, that their birds were imported from overseas as sufficient guarantee of their excellence. Here the bulk of our farmers follow them. Now a good bird is a good bird, wherever it was bred, and a bad bird is no better for a sea voyage. There are birds in Rhodesia of Rhodesian breeding to-day every whit as good as any ever imported. The trouble is, that there are not enough of them. We have breeders just as keen, just as skilled as their European or American confreres; but they are too few.

The question which now arises, is, where are the breeders of high-class utility poultry to come from? The need, once recognised, will soon supply itself. The difficulty really lies in convincing farmers, that the aid of the breeder is necessary to success. Let it be here remarked, that it is taken for granted that Rhodesian Farmers keep poultry as an adjunct to their other operations. There may be a few unknown to me who place poultry raising in the place of first importance. If such there be, these remarks do not apply to them. Most general farmers will find their multifarious duties preclude any but the most cursory attention being paid to their fowls and, if they are single men, will most likely leave them to be cared for by native servants; if they are married, the poultry will be the care of the wife, who, in her turn, will have but little time left for her fowls after her domestic duties have received attention. Surely under these circumstances fowls may prosper and multiply but the quality will not improve. Extraordinary laying powers in the domestic fowl are the result of generations of careful selective breeding towards that end. The hen, in a state of nature, did not lay more than one, or at most two nests of eggs before proceeding to hatch them. By removing the eggs as they were laid, man in the course of centuries taught the fowl to lay two or three settings before hatching; but here progress stayed for ages. Further care in selection, by setting only the eggs of good layers, gradually improved the

laying powers of certain strains, until we got the magnificent results of 250 eggs per annum from specially selected birds. But, without such selection, the tendency is not towards improvement, but degeneration. Let our vigilance be relaxed for a few seasons and our laying averages suffer. Feeding will not produce eggs, if our fowls are not bred towards that end. Trap nesting is the only test possible and trapnests require hourly attention. There are still people who believe in all sorts of exterior signs as indications of laying powers. There are still more who imagine that pretty nearly every hen of a recognised laying breed is a good layer. Both ideas are false. There is no outward sign by which a good layer may be known and, as for breed, the less said the better. Some Hamburg hens lay 260 eggs in a year; there are some which do not pay for their keep. The only proof of good laying is *eggs*; and the only way to discover a good layer is by trapping her, identifying her by name or number, marking her eggs and registering every one she lays over a period of at least a year. If she then stands the test she is *ceteris paribus* fit to breed from. If she fails by ever so little, she should be kept out of the breeding pen. Of course one must exercise even more care than this in selection, if one requires a real advance in the quality of one's strain. The hen must be selected for physique, appearance, health, and habits as well, but for eggs in the first instance, if our aim is to establish a laying strain. It goes without saying, that no Rhodesian farmer has time for this rigid selection. Only the breeder who keeps few fowls, who knows each thoroughly and retains only the very best, is able to guarantee laying powers in the progeny of his birds, and that only to a certain extent, as far, say, as their second generation. Further he cannot go.

The breeding of high-class table poultry is even more difficult; and farmers and fatteners both in England and America prefer to obtain male birds from breeders or fanciers and cross these upon their own stock.

The poultry-keeper must, however, beware of purchasing birds which have won prizes at shows. There fancy points alone count and, as has been remarked already, exterior points are no proof of excellence. There was a time when fluff was held to be a sign of good laying in Cochins and

fanciers consequently bred for fluff. To-day the Cochin is what Mr. Tegetmeier calls a useless mass of fluffy feather. The fluff had nothing to do with the laying and, by mistaken breeding, the fowl deteriorated. Again the large combs of Leghorns and Minorcas were held to be signs of good laying. Therefore fanciers bred for comb-points to such an extent that sterility resulted. The practical utility man cares little for fancy points. He wants results.

Now, if every pullet whose mother was a good layer equalled the maternal average, there would be no need for further selection. Such, however, is not the case. Some few only are as good, one out of a hundred may perhaps be better, but many fall a little short showing a tendency to revert to type, while perhaps one or two may be only fair layers. If these wasters are not weeded out, results will suffer. Hence selection must be rigidly enforced through many generations before a strain can be said to be fixed. Fixed, however, it never becomes. Let the breeder's vigilance be relaxed for a couple of years and degeneration will have set in before he is aware of it.

To give a concrete example from an actual case. The writer purchased in 1894 a breeding pen of Minorcas from a friend who had bred his strain carefully for six or seven years. The pullets, nine in number, were put to a cock of the writer's own breeding, whose mother and grandmother had each laid 230 eggs per annum, and the pullets themselves, when received, averaged over 215 per annum; the highest individual record being 238 and the lowest 201. In the third generation this average had risen to 218 per hen per annum, the lowest individual score being 209, the highest 240. The stock was sold in 1898 to a person who called himself a breeder (Save the mark!) who hatched every chicken he could get out of an egg. The result was, that, though good blood in the male line was introduced, the strain had in five years time, when it came again into the hands of a competent breeder, fallen off to such an extent, that the average was below 190, and only one hen out of 40 reached a yearly count of 219. At the end of 1907 under good management, the average had risen to 198 and there were four hens which had laid 230 and over.

This is exactly what happens on a farm. Deterioration though slow at first proceeds with accelerated velocity as years go on. A very little thought will convince any poultry keeper he must either devote his whole time and attention to his fowls or cease to be his own breeder. To fill up the gap in the industrial circle breeders must become more numerous and more careful, the price of good birds must drop considerably and breeder and farmer work together harmoniously, neither trenching on the other's ground.

The great difficulty the industry is confronted with in its search for good breeders is the rarity of the combination in one person of those characteristics which make the ideal breeder. The farmer's chief aim is profit; the breeder who places profit in the first place usually ends by becoming a sharper. If his word cannot be taken with the most absolute confidence, the breeder's usefulness is at an end. If he is slipshod in keeping the records, his strain will suffer. If he does not love his work with his whole heart and soul, he will never succeed. The ideal utility breeder is the man of some small private means, who makes poultry his hobby and can afford to be honest, since his daily bread is not dependent upon his poultry sales. For this reason, if no other, the amateur is a tower of strength to the poultry industry. But more, his very amateurism is a gain, since this argues his real love for the profession, which is worth more to him and his customers than far greater knowledge and experience in a mere timeserver.

Amateur breeders, however, are apt to make their greatest mistake in choosing their breed. Some take up one which is easily come by; others plump for the one which is in favour at the moment; others again are influenced by the poultry column of a newspaper, but the greatest number arrive at a decision after a look through the poultry exhibits at a show. It matters little how the choice is made, the result is usually the same: the beginner gets saddled with the wrong thing. The error usually arises through ignorance of the vast variety from which a choice can be made, and failure to differentiate between fancy and utility poultry. Of course there are men who prefer the fancy article to the useful one, but luckily in South Africa the thorough going

fancier, whose sole care is for the outward beauty of his fowls, is a very rare person, and in Rhodesia he is, as far as I know, nearly non-existent. There is, however, an intermediate class, which desires to attempt the impossible: to combine showing and utility. To such, a word in time may be useful—Don't. Fashions in poultry change as often and as radically as in dress. One may succeed in winning prizes at shows, one may attain excellence that pays without showing; but to only a select and lucky few is it given to do both, and *they* are old, old hands at the game. Twenty years ago Hamburgs were in fashion. How many know a Hamburg when they see it to-day? Yet twenty years seems a short time to devote to a breed, which it took thousands of years to develop from the primeval jungle fowl, Twenty years! It takes a breeder just about that time to become aware of his colossal ignorance and teach him something of his limitations!

The profession of poultry-breeder is full of pitfalls for the hasty and the inconstant. One breed is occupation enough for a lifetime. A long lifetime is not enough to learn what one breed can teach. Choose carefully, think long and weigh well before making the first purchase and then stick to it, as long as you have an eye to see. If you do this and there is the true poultryman's spirit in you you will advance your breed, perhaps beyond your wildest dreams. Do otherwise and, when you have chopped and changed a dozen times, you will have no success to record and have gained no experience worth mentioning.

One reason why beginners often choose a breed quite unsuited to their personality is that, having no guide and being ignorant of the vast variety of form exhibited by domestic poultry, they conclude that the fashionable breed of the moment must have some weighty recommendation beyond all others. For the benefit of such as are entirely ignorant, it may be as well to take a hasty view of the entire poultry world and briefly point out the failings and excellences of each breed, which has at present any claim to merit as a utility fowl, and this will be done in our next issue.

(To be continued.)

Swine Husbandry in Rhodesia.

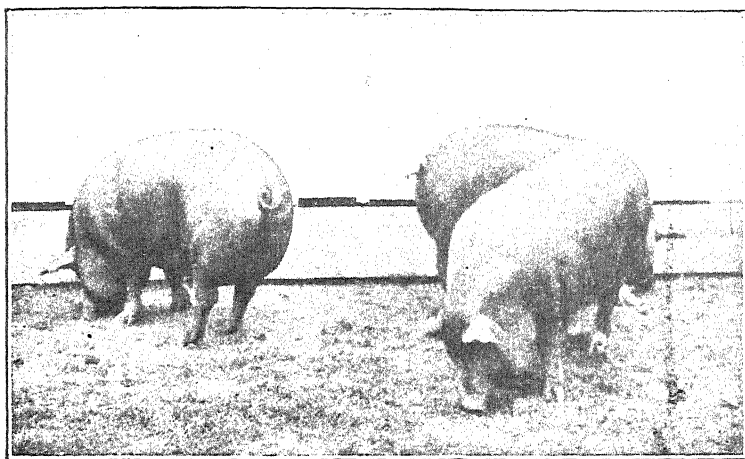
BY LOUDON M. DOUGLAS, F.R.S.E.

It is somewhat difficult at the present time to lay down fixed rules for the conduct of swine husbandry in Rhodesia. There is hardly any data to guide us: such as is available in other pig breeding countries, and which has been ascertained by patient investigation. We know, however, that in every country where proper attention has been given to swine it has been the means of adding largely to the profits of agriculture. This general remark applies to every country in Europe, to America and to Australia. It is therefore primarily right to assume that the pig is an essential feature of the farm. But we can go further than this and say that in tropical and sub-tropical countries swine have thriven where other live stock has failed. They are less subject to climatic diseases than other animals and hence are of immense value to the Rhodesian farmer because, as the return of imports clearly show, there is a large demand for pig products not only in Rhodesia but throughout South Africa. It may be of interest to state that the latest returns of imports, namely those for 1910, exhibit the fact that over £290,000 worth of cured meats and pig products are imported into South Africa per annum. This figure takes no account of the local produce, which is now considerable and which would be much greater if facilities for curing were available. We may state the value of the produce imported, in round figures, at £300,000, in order to conveniently remember it. Such a figure is very significant as, roughly speaking, it represents the turnover of some nine or ten bacon factories each handling about 200 pigs per week. This therefore is a business which is lying at the doors of the farmers of South Africa, and, now that the fact is being appreciated, there is little doubt that means will be taken to organise and develop swine husbandry.

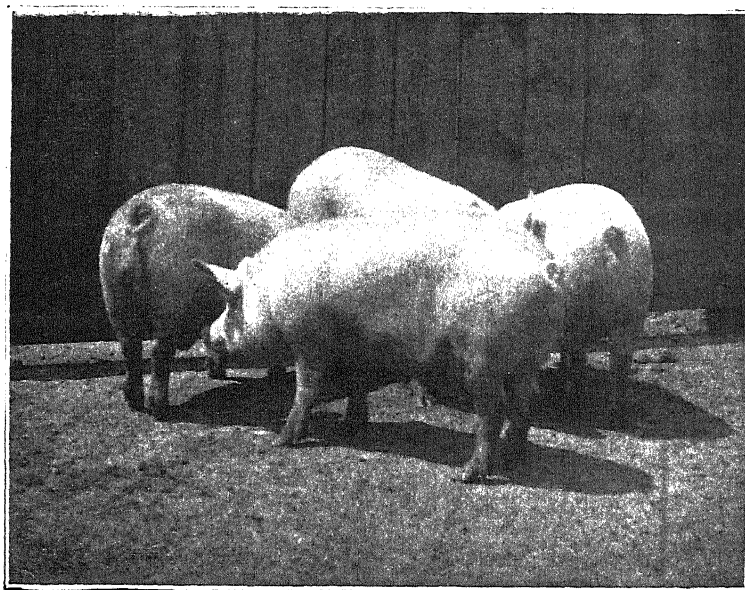
The first consideration in a new departure like this is the swine supply, and here, at this early stage of development, it may be laid down that much care is needed in connection with the creation of the races which will ultimately dominate the country. For, we are bound to assume that as time goes on, certain breeds or crosses will be found to be more serviceable than others, and much patient observation will have to be carried on so as to arrive at the correct type of animal wanted. The pig is essentially an adaptable animal, and as it is also prolific, it is quite possible to flood the country with a type which may possess undesirable characteristics. We must therefore endeavour to collect and collate all the information possible as we go on, so that in a few years time it will be easy to lay down definite rules for the conduct of swine husbandry in Rhodesia.

Swine differ from other kinds of live stock in essential particulars. Cattle and sheep throughout the world are practically all of the same conformation, or at least all breeding is developed so as to reach the same ideal. I speak now of cattle and sheep which are utilised for food. Dairy cattle do not come within this category as their function is to supply butter and milk. Pigs, however, are of many different types. The principal breeds in the British Empire are six in number, namely,— The Large Yorkshire, The Middle White Yorkshire, The Tamworth, The Berkshire, The Large Black, The Lincolnshire Curly Coated.

These various breeds are all specialized and their particular points are maintained and developed by breeders who are specialists in their business. In other countries there are different types. Thus, in the United States which has a pig population of some 50,000,000 animals, or about half the whole number in the world, the principal breeds are the Poland China, the Duroc-Jersey and the Chester White. In Denmark, which for its size is the largest pig producing country in the world, the type is known as the Land Race. In France they have the Craonnais; in Germany various white breeds; in Hungary the Mangalica. Every country has its own particular type, and it may be assumed that in every case there is good and sufficient reason for the selection. All these types however, have either been originally mostly



Prime medium Butcher's Pigs, for pork.



Prime English Bacon Pigs.

derived from British stock, or are in process of being transformed by British breeds. Hence we arrive at the conclusion that the British breeds already referred to, are regarded as the best types of swine in the world.

Having got so far, it is next necessary to ascertain how to begin to find out what breeds are most suitable for Rhodesia. There being no experimental data available on the subject it will be best to begin with first principles. From that point of view it is desirable to start by considering what food is available. The principle food which must be kept in view is maize which is not only easy to grow but is also easily converted into bacon on the hoof. The other principle product to be considered is kaffir corn. There are also of course, the standard cereals such as barley and oats and which, as will appear presently, have a certain value in swine husbandry greater than their ordinary market prices. The leguminous beans and peas we may require, and lucerne if we can get it.

Starting on the basis of such food stuffs, it will be necessary to see how to put them to the best possible use and in what combinations they will serve our purpose best.

Maize, or mealies, is used over a very large part of the United States as the principal food for swine, and that may be taken as good evidence that it is a profitable and suitable feed. It contains about 5 per cent. of oil; its nitrogenous or protein value is about $10\frac{1}{2}$ per cent.; and its carbohydrates amount to about 70 per cent.

It may be well to explain here that the three principle ingredients in food are:—Crude Protein, which is the nitrogenous or albuminous constituent, and which goes to make hard tissue or lean meat; the Carbohydrates, which consist of the starchy contents and which go to provide such nourishment as is required for the production of energy in the animal body. Foods classified as Carbonaceous contain a large proportion of carbohydrates. The oil present is utilized pretty much in the same way as the carbohydrates, and the process of transformation into energy or animal tissue is known as metabolism. Besides the oil, protein and carbohydrates, which are always present in food stuffs, there are

also varying quantities of water and mineral matter, each of which has to be taken account of in constructing a food ration.

These elementary definitions will enable us to understand that good swine husbandry is merely the intelligent use of the foods lying to hand, and which will supply this maximum of energy and growth with the minimum of waste; hence, when all foods are reduced to a common denomination of values and when certain quantities are known to give specific results, it is clear that we can reduce feeding to an accurate method or to a scientific basis.

We will now examine the principal food products of Rhodesia from this point of view, in order to see where it may lead to.

ANALYSES OF SOUTH AFRICAN FEEDS.

	Water.	Protein.	Oil.	Carbohydrates Ash and Fibre.
Kaffir Corn (Bran) ...	11.66	10.10	3.15	76.09
Kaffir Corn (Wheat) ...	10.69	10.32	3.26	75.73
Golden Eagle Maize ...	10.47	10.06	4.17	74.30
Horse Tooth Maize ...	11.12	8.04	4.47	76.27
Hickory King Mealies...	11.24	9.54	3.79	75.43

It will be seen that there is very little difference between the Protein or flesh forming constituents of Kaffir Corn and Golden Eagle Maize, but there is much difference between these and Horse Tooth Maize, and Hickory King Mealies are only slightly less valuable than either from the lean meat point of view. The inference from these figures is that as a lean meat producer Horse Tooth Maize is of less value than any of the cereals. The oil contents, however, shew wonderful variations, and whereas Kaffir Corn is low in oil contents, Golden Eagle Maize is not so high as might be expected, and Horse Tooth Maize is highest of all. The other contents, such as the Carbohydrates, Ash and Fibre, do not interest us so much at the moment.

Generally speaking, it may be said that all these cereals are fat producers, owing to the percentage of oil that is present, and this more especially applies to Horse Tooth Maize, which should only be used in conjunction with about 50 per cent. of the total rations, the remainder being supplied by

highly nitrogenous material, such as bran or sharps. Best of all if a supply of separated milk is available it will supply the proper diluting quality and produce firm bacon.

Mixing foods invariably results in profitable feeding as, in combination, cereals are more easily assimilated than when fed separately; hence a mixture of maize and barley meal or bran, give much better results than any one of the foods alone. But the ingredients for these mixtures may not be available, so that it is necessary to devise a similar mixture by simple means, and this can be done by grinding the maize and the maize-cob together; this simple expedient will give a good balanced ration. The mixture should always be softened and cooked.

The equivalent of maize when fed alone is an average increase in the live weight of 10.9 lbs. of flesh per bushel of corn fed, but in combination, this rate of increase will be somewhat less.

If it can be managed by far the most profitable and easy way of feeding maize to swine is in the stalk. As soon as the maize has reached maturity, or when the milk has set, the pigs are turned into it. The animals should be about one hundred weight (112 lbs.)—live weight—and, as at that age they are nimble, they very shortly find out all about pulling down the stalks so as to find the ears. It has been found that pigs fed in this way produce the cheapest kind of pork, owing to the absence of any need for labour, either in preparing food or husbanding it. It has also been shewn that animals so fed or allowed to forage for themselves, grow much faster* and thrive better. Why this is so it is difficult to explain. One investigator thinks that "the mineral matter and worms obtained from the soil and freedom to exercise and eat at will, probably have a good effect upon digestion. Then, too, the ears of maize when husked become dry and hard, while those in the husk remain moist. Mastication in the case of the moist corn is easier; the pigs eat more, and, therefore, gain more rapidly and economically."* One of the necessities of this simple form of feeding swine on maize is that the pigs should be fenced into restricted areas so as to prevent them roaming at large and committing destruction. The fencing may be of a makeshift description, and capable

*Bulletin 104: University of Minn., 1907.

of being moved on; one acre of land being fenced off at one time, and a bunch of 20 pigs of about 1 cwt. each, preferably pasture fed, ought to fatten in such patches in about 60 days. At the end of that time they will average about 16 stone, or 224 lbs. a piece, which is just about the correct bacon weight.

The advantage of the field-feeding system does not end with the quick fattening of the pigs. The manure is left properly distributed over the soil, and this is a great advantage to future crops.

These brief references to a very extensive subject enable us to conclude that maize and kaffir corn in their various forms are foods well adapted for swine husbandry, and if the dry corn or maize has to be used, it should be ground up and mixed into a balanced ration of which the corn or maize should form about 50 per cent. the remainder consisting of nitrogenous material such as bran. Feeding maize in the stalk is by far the most economical and advantageous as it produces pork quickly and also leaves the land in good condition for future crops. It also obviates the necessity of harvesting and saves an immense amount of labour which can be more advantageously applied in other directions. It is a condition of this method of feeding that the pigs should have access to plenty of water as, more especially during the earlier period of existence they require a good deal. It has been ascertained for example[†] that a pig two months old, requires about 12 lbs. of water per day and that this quantity gradually decreases through a curve of six months duration to about 4 lbs per day: the general practice has been to give the water in the shape of slop with the food, but this would seem to be a mistake, as experiment has shewn that the animals thrive best when the slop is made in suitable proportions in the ratio already laid down.

In any case it is desirable to simplify the feeding, and to seek to utilise, as far as possible, the feeding stuffs available. The pig is essentially an omniverous feeder, and can be made the vehicle of converting otherwise unsaleable food into an easily marketed article. This principle has been demonstrated all over Europe and in many other countries, and it is one which equally applies in no small degree to Rhodesia.

[†]Cir. 133. University of Illinois by Wm Dietrich.

Notes on Bee Keeping.

BY FREDERICK SWORDER.

I.—THE PROSPECTS.

Some few years since I had the honour of contributing Articles on Bee-Keeping to the Transvaal Agricultural Journal and I believe they have been the means of opening the eyes of many residents in South Africa to the possibilities of honey production. At least a keener interest has of late been evident, and many novices, with advantage to themselves, have given this interesting study their close attention.

I trust that the series of Articles to appear in this Journal, will prove a further means of inducing our Farmers, Fruit Growers and others to take up this side issue in Rhodesia, where the possibilities for the production of honey are great.

Although my knowledge of this vast territory is limited, yet as one travels by rail through the country, it is apparent, especially about the banks of rivers, that with its dense growth of bush and wild flowers, there must be a plentiful supply of nectar going to waste. Previous to the existence of Johannesburg the older farmers in that district tell us, that on account of its wilderness-like aspect very few bees could be found there, yet as the population increased cultivation followed, with the satisfactory result that bees also became more plentiful.

In that neighbourhood there are now numbers of successful bee-keepers, and not only this fact, but the quantity and quality of the produce staged by them on the Show benches proves conclusively the success of their efforts. There seems no reason why Rhodesia, although quite a new country, cannot aim at and build up a similar standard and endeavour to produce this health giving-commodity for human consumption for which there is a good and increasing demand, commanding the best prices in the world.

We are led to believe that with her incoming settlers of the right stamp Rhodesia is gradually becoming more prosperous, and as the breaking in of this vast expanse proceeds, the cultivation of the land must follow, while many kinds of fruit trees and crops will also demand attention, and it is in the fertilisation of these blossoms that the honey bee plays such an important part.

In South Africa the production of honey for many years has been much neglected, while even now the product still remains in the nature of a luxury ; in this country with its abundance of bush blooms and veld flowers, sufficient honey should be produced to ensure it becoming a commercial commodity.

The slow advance in bee-keeping is due to several reasons, but chiefly to time-worn prejudices which die hard, and also the want of knowledge on the part of those who, as it were, after a style of their own, have kept bees.

It is pleasing to notice that the old practice of keeping bees in casks or any kind of box which came to hand, is gradually being discarded in favour of the *bar-frame* hive, which, as now manufactured, is a vast improvement, in every way, for the better handling of bees.

With this style of hive no difficulties present themselves to the novice or the bee master. A thorough examination of the contents of any hive is easily made, and a far greater weight of honey is secured, while the product also is in a saleable condition and fit for the breakfast table.

Scarcely any statistics are available shewing the number of Rhodesian bee-keepers, or the kind of domicile they adopt, yet I am convinced that many of the new settlers would take up this essential branch of farming providing correct information on the subject could be imparted to them.

Many excellent books on bee-keeping can be obtained, all giving useful hints, but they do not impart that confidence to the novice, which will enable him to handle bees successfully.

Nothing, in my opinion, is better calculated to inspire this characteristic than a lecture delivered in the open air coupled with a demonstration with live Bees in a Bee Tent.

(To be continued.)

Demonstration of Steam Ploughing

HELD AT SALISBURY.

By C. A. BURNEY.

On December 9th, by the courtesy of the Anglo-African Trading Co. and under the supervision of Mr. W. Kernick, Salisbury farmers had an opportunity of witnessing the work of a steam plough in breaking up new land. The demonstration was carried out with a Marshall single-cylinder 25-h.p. traction engine, drawing an 8-bottom, or 8-furrow, engine gang plough, made by the J. Deere Plough Co. Each bottom cut a 14-inch furrow, the total width cut being 9 feet 4 inches. The depth varied from 5 to 7 inches in new land, while in old land any depth up to 10 inches can be ploughed. The speed recommended by the makers is at the rate of 2 miles per hour, and when making this 20 to 24 acres can be turned over in a working day of 10 hours. It is considered that a 20-h.p. engine is needed for the working of an 8-furrow plough.

Everyone who watched the demonstration expressed admiration of the work done. The furrows were cleanly cut and well turned over, and roots were ripped up or cut clean through without the slightest sign of strain on the plough. Even the tough "Grape Vine" offered no obstacle to smooth running. The manipulation of the gangs when ploughing is most simple. Each gang has two mould boards and shares, and each gang works independently of its neighbours. By this means there is no rigid frame with a number of ploughs coupled solidly together. The advantage of this is apparent, for when one gang encounters an obstacle or a rise or fall in the ground, instead of all eight bottoms being affected, only

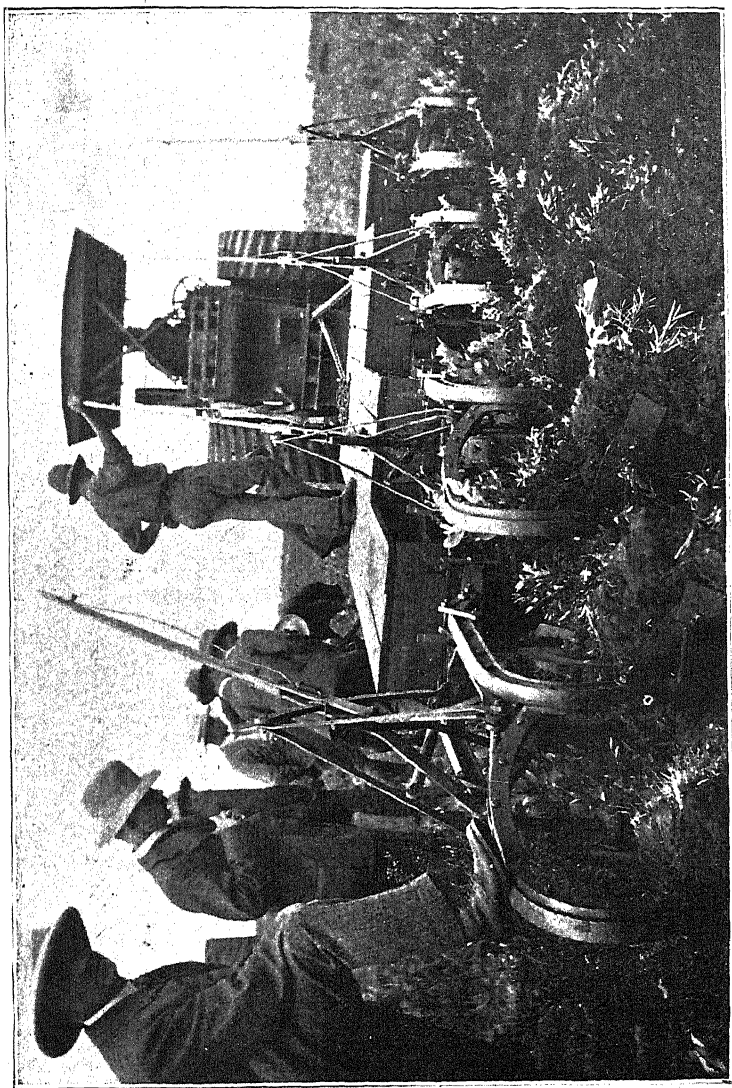
the gang in question raises or lowers itself as the nature of the ground or obstacle demands. Especially would this be appreciated when ploughing over ant-heaps. In the event of a breakage occurring in one gang, this can be detached and replaced with a minimum loss of time.

The large steel frame in front, carried on three strong wheels and boarded over, provides ample room for the man in charge of the levers to manipulate them at the ends of the furrow and in turning. It was intended, after a sufficient amount of land had been broken up, to cross-plough with the addition of a disc-harrow attachment working behind, but owing to the inclemency of the weather this had to be abandoned. The cost of the 8-furrow plough complete, with an extra set of mould boards and shares for use in old land, is £175.

As a result of this demonstration, it is understood that an order for a similar plough to that used was given by a farmer in the Suri-Suri district. The outfit is more suitable for a contractor, breaking up land at any season of the year, at a fixed charge per acre, than for an individual farmer to use.

The engine traverses the ground immediately in front of the ploughs, no cable system being employed. This is an economy and possesses the merit of simplicity, but will debar the use of the plough on soft wet land. On the other hand, the power is such that land can be ploughed continuously during the dry season, when it is far too hard-baked for ox or mule traction to be possible. One white man in charge of the engine and able to adjust the plough, with a native to stoke and another to work the levers of the ploughs, is all that is required.

Even in this land, where the ox reigns supreme, there is scope under certain conditions for steam ploughing tackle of this description to do useful and profitable work.



Demonstration of Steam Ploughing. Examining the Plough.

Special Railway Rates

FOR THE

Benefit of the Farming Community.

(Compiled.)

RATES FOR FARM HANDS.

The Board of the Rhodesia Railways have agreed to grant a special fare of $\frac{3}{4}$ d. per head per mile, from Vryburg to stations in Southern Rhodesia, for the conveyance (3rd class) of trained native farm hands from stations south of Vryburg, when in batches of not less than six and upon production of a certificate signed by a Civil Commissioner of the district in which the farmer resides, or by the Director of Agriculture.

RATES FOR AGRICULTURAL MACHINERY, PRODUCE, ETC.

When Carried at Owner's Risk.

NOTE.—Unless otherwise specified, these rates are subject to the usual minimum charges; a smaller consignment than the minimum stipulated is carried at the ordinary rate, unless the resulting charge amounts to more than that for the minimum quantity at the special rate, in which case the latter will apply. Charges are reckoned at full rates, and the rebate applicable to each item deducted from the gross charge, the net freight only being invoiced.

Temporary Rates for Agricultural Produce grown in Rhodesia or Mozambique Company's Territory.

STATION TO STATION—OWNER'S RISK.

To secure the undernoted rates, consignor is required to declare on the Consignment Note the District in which the Produce was grown, and to endorse the consignment note "Owner's Risk."

ARTICLE.	Beira-Salisbury, including Lomagundi and Mazoe Branches.	Salisbury, Broken Hill, Selukwe and West Nicholson Branches.	Blinkwater Branch.	Broken Hill- Congo Border.	Beira-Gwelo, including Lomagundi and Mazoe Branches.	Gwelo-Broken Hill, including Selukwe and West Nicholson Branches.	REMARKS.
1. Maize and Kaffir Grain (not beans).	One-fourth third class "inwards" rate.	1d. per ton per mile.	1d. per ton per mile.	3d. per ton per mile.	...	...	Minimum 5 tons.
2. Barley, Beans (dried), Bran, Buckwheat, Groats, Ground Nuts, Hops, Kaffir Grain, Maize, Meal, Mealina, Oats, Onions, Peas (dried), Potatoes, Pumpkins, Rye, Samp, Wheat, Linseed.	...	...	2d. per ton per mile; minimum charge as for 50 lbs.; no lowering therefor; charge as for 50 lbs.; no lower charge than 1/- per consignment.	per ton per mile; minimum charge as for 50 lbs.; no lowering therefor; charge as for 50 lbs.; no lower charge than 1/- per consignment.	Half third class "Inwards" rate.	Fourth class	...
3. Chaff, Fodder, Forage, Hay, Lucerne, Oathay, Straw	...	...	2d. per ton per mile.	per ton per mile.	Half third class "Inwards" rate.	Fourth class	When conveyed in full truck loads, charges calculated at actual weight with a minimum of 4-9ths of the truck's carrying capacity.
Do.	...	...	Fourth class	Fourth class	Fourth class	Third class	When conveyed in smaller quantities than full truck loads. Subject to a minimum charge as for 50 lbs.; no lower charge than 1/- per consignment.

† Traffic carried at fourth class, or a lower rate than fourth class, between Stations on the standard gauge and the Lomagundi Branch (narrow gauge), is subject to a transhipping charge of 10d. per ton to another section is charged the rates applicable over each section.

Grain, including Kaffir Grain, Kaffir Beans (dried) and Maize, is conveyed from stations on the above-mentioned sections, Broken Hill-Congo-Border Section and Lomagundi Branch excepted, to any Rhodesia Railway Station south of Francistown, at the following rate:—

3d. per ton per mile, plus 1/8 per ton terminals when in quantities of not less than 15 tons, subject to a minimum rate of 12/- per ton.

This rate also applies to Vryburg for traffic consigned beyond that Station.

When conveyed to Beira for export (other than through Railway Agency) from the same sections, the following rate is charged:—

For rates for Maize for export overseas beyond South Africa, through the agency of the Railways, see page 87.

Temporary Rates for Rhodesia-grown Tobacco (unmanufactured).

STATION TO STATION, OWNER'S RISK.

To secure the undernoted rates, consignor is required to declare on the Consignment Note the District in which the Tobacco was grown, and to endorse the consignment note "Owner's Risk."

Beira-Gwelo Section, including Lomagunda and Mazoe Branches.	Gwelo-Broken Hill Section, including Selukwe and West Nicholson Branches.	Blinkwater Branch.	Broken Hill-Congo Border Section.	From any Station to Salisbury and Bulawayo.	From Salisbury and Bulawayo to any Station.	From Salisbury to Bulawayo.
Half third class "Inwards" rate; Station to Station; minimum charge as for 50 lbs.; no lower charge than 1/- per consignment	Fourth class rate, Station to Station; minimum charge as for 50 lbs.; no lower charge than 1/- per consignment.	2d. per ton per mile, Station to Station; minimum charge as for 50 lbs.; no lower charge than 1/- per consignment.	3d. per ton per mile, Station to Station; minimum 5 tons, smaller quantities than 5 tons, third class rate.	$\frac{1}{4}$ d. per ton per mile; minimum charge 1/- per consignment. When consigned to Tobacco Warehouses for curing or grading purposes and so declared.	$\frac{1}{4}$ d. per ton per mile; minimum charge 1/- per consignment. When consigned from Tobacco Warehouses, graded and baled.	$\frac{1}{4}$ d. per ton per mile; minimum charge 1/- per consignment. When consigned from Salisbury to Bulawayo on traffic consigned to Stations south of Bulawayo.

*Traffic carried at fourth class, or a lower rate than fourth class, between Stations on the standard gauge and the Lomagunda Branch (narrow gauge). is subject to a transshipping charge of 10d. per ton.

Rhodesia-grown Tobacco, unmanufactured, is conveyed from Stations on the above-named sections, Broken Hill-Congo Border Section and Lomagunda Branch excepted, to any Rhodesia Railway Station south of Francistown, at the following rates:—

$\frac{1}{4}$ d. per ton per mile, plus $\frac{1}{8}$ per ton terminals, minimum 5 tons, minimum rate 12/- per ton. Station to Station, Owner's Risk
 $\frac{1}{2}$ d. per ton per mile, plus $\frac{1}{8}$ per ton terminals, minimum 2 tons, Station to Station, Owner's Risk, unless charging as for 5 tons at the $\frac{1}{4}$ d. rate is cheaper.

1d. per ton per mile, Station to Station, Owner's Risk, unless charging as for 2 tons at the $\frac{1}{2}$ d. rate is cheaper. The 1d. rate is subject to a minimum charge as for 50 lbs.; no lower charge than 1/- per consignment.

When conveyed from the same sections to Beira for export, the following rate is charged:—
 $\frac{1}{4}$ d. per ton per mile, plus $\frac{2}{6}$ per ton terminals, Station to Station, Owner's risk; minimum 5 tons.

The following Special Rates are applicable to the articles enumerated when carried at Owner's Risk and consignment notes endorsed accordingly.

S. to S. signifies Station to Station, *i.e.*, loading, off-loading and cartage is performed by sender and consignee, respectively.

ARTICLE.	FROM	TO	RATE.
1. Bags or sacks to be used for carrying grain.	Any Station ...	Any Station ...	Third Class Rate, less $33\frac{1}{3}$ per cent.
Do.	Cape Town ...	Bulawayo ...	6s. 10d., 100 lb. <i>Exclusive of cartage at Bulawayo.</i>
Do.	Port Elizabeth	Do.	6s. 0d., 100 lb.
Do.	East London ...	Do.	6s. 3d., 100 lb.
2. Cotton Seed ...	Any Station ...	Any Station ...	Half Third Class "Inwards" Rate.
3. Cotton in bales, pressed, 120 cubic feet, or less, to the ton.	Any Station, Broken Hill to Livingstone both inclusive	Beira, for export.	$\frac{1}{2}$ d. per lb. nett; minimum, 5 tons.
Do.	Any Station in Southern Rhodesia and Mozambique Co.'s Territory.	Do.	1d. per ton per mile; minimum, 5 tons.
4. Dip, Sheep and Cattle.	Any Station on Beira-Gwelo Section, and Lomagunda and Mazoe Branches.	Any Station on Beira-Gwelo Section and Lomagunda and Mazoe Branches.	Half Third Class "Inwards" Rate.
5. Dipping Tanks and materials, including cement used in the construction of, on production of a certificate signed by the Director of Land Settlement.	Do.	Do.	Do.
6. Fencing material (<i>i.e.</i>) Fencing Wire, Plain, Barbed or Netting, Wooden Fencing Poles, Standards, Droppers, Struts, Strainers, Staples, Fencing Hurdles, Straining Posts, and Fittings, Fencing Gates, plain or common, for use in connection with Farm Fencing.	Any Station on B. & M.R. & R.R.	Any Station on B. & M.R. & R.R.	Half Third Class "Inwards" Rate The consignment note should be endorsed "For Farm Fencing," and the material properly described.

SPECIAL RATES—continued.

ARTICLE.	FROM	TO	RATE.
7. Firewood.	Any Station (Lomagunda Branch excepted).	Any Station (Lomagunda Branch excepted.)	1d. per ton per mile, plus 1/- per ton terminals; minimum rate 24d. per ton including terminals. Full truck loads, charges calculated on actual weight, with a minimum of three-fourths of the marked carrying capacity of the truck, S. to S.
8. Jute and similar Fibres.	Any Station ...	Beira, for export.	1d. per ton per mile, minimum 5 tons.
9. Manures and Fertilizers	Any Station on Beira-Gwelo Section.	Any Station on Beira-Gwelo Section.	Half Fourth class "Inwards" rate, S. to S.; minimum, 1 ton.
Do.	Do.	Any Station beyond Gwelo	The rate to Gwelo as above, plus ordinary rate beyond; S. to S.; minimum, 1 ton.
10. Potatoes (imported for <i>bona fide</i> planting purposes)	Any Station on B. & M.R. & R.R.	Any Station on B. & M.R. & R.R.	Half Third Class "Inwards" Rate.
Potatoes (imported for <i>bona fide</i> planting purposes)	Cape Town ...	Bulawayo ...	7s. 2d., 100 lb.
Do.	Port Elizabeth	Do.	6s. 4d., 100 lb.
Do.	East London ...	Do.	6s. 7d., 100 lb.
11. Salt, coarse and rock, bagged, consigned direct from S.A.R. Stations	Bulawayo ...	Salisbury, also to intermediate stations when cheaper than ordinary rates	£1 17s. 8d. per ton, S. to S.; minimum, 5 tons.
Salt, coarse and rock, bagged	Beira ...	Do.	£4 13s. 6d. per ton; S. to S.; minimum 5 tons.
12. Timber (Redwood)	All main line Forest Stations south of Victoria Falls (inclusive).	Vryburg for S.A.R. Stations or Beira for export.	½d. per ton per mile. S. to S. Trucks loaded to their marked carrying capacity.
13. Vegetables (Market Garden Produce)	Any Station ...	Stations South of Vryburg.	½d. per truck per mile to Vryburg, plus 1/8 per ton terminals; minimum 200 lbs.,

Traffic conveyed from one section to another is charged the special rates applicable over each section.

Where special rates are in operation over certain sections only, traffic originating and terminating beyond the limits of such sections obtains the benefit of any reduction which may be in force on any section over which it may travel, provided the special rate conditions are complied with.

The Railways reserve the right to grant or withdraw special rates for any traffic, in certain circumstances, without previous notice.

REBATE ON IRRIGATION PLANT AND MACHINERY

Irrigation plant and machinery, such as water pipes, valves, fittings, sluice gates, hand and air pumps, windmills, tanks, and tubes for lining wells, may be conveyed at third class rate, owner's risk, in the first instance, and on production of a certificate signed by the Secretary Estates Department, Salisbury or Bulawayo, to the effect that such plant or machinery is actually in use for irrigation purposes, a rebate to one-half of the third class rate (one-half third class "inwards" rate over the Beira-Salisbury section) will be granted.

Applications for rebates should be addressed to the District Traffic Superintendent, Bulawayo, Salisbury, or Beira, as the case may be.

LIST OF AGRICULTURAL IMPLEMENTS AND APPLIANCES

Carried at half third class "Inwards" rates over Rhodesia Railways (all sections) and Beira and Mashonaland Railways, owners risk.

The actual description, viz., the name of the part or parts of agricultural machinery or implements must be specified on the Consignment Note, and endorsed "Agricultural Implements and Machinery, Owners Risk," otherwise No. 3 rate is charged.

Baling Presses	Curd Racks & Coolers	Milk Pumps and Ele-
" Wire	" Rakes	vators
Bark Cutters	" Scoops	" Vats
Binders	Cultivators	" Warmers
Binding Twine	Cutaway Harrows	Milking Machines
Broadcast Sowing		Mowers
Machines	Dairy Scales	
Bone Mills	Dam Scrapers	Oil Cake Breakers
Butter Barrels	Dip Baths	Planters for Mealies,
" Churns	Dipping Tanks	Kaffir Corn, Turnips,
" Coolers	Disc Harrows	and Potatoes
" Driers		Ploughs, all descrip-
" Ladles	Farmers' Tools	tions
" Moulds	Fodder Shredders	Pulverising Harrows
" Packers		Potato Diggers and
" Pats	Grain Drills	Forks
" Printers and	Grain Dressing	Prickly Pear Cutters
Weighers combined	Machines	(hand power)

Butter Printers	Hand Chaff Cutters	Railway Milk Cans
" Prints	Harrows	Reapers
" Rammers	Hay Rakes	Root Cutters
" Rollers	Hay Collectors	
" Scoops	Hay Presses (hand	Scythes and Sickles
" Shovels	and power)	Scarifier
" Spades	Hay Loaders	Shredders
" Spoons	Hay Tedders	Sheep Shearing
" Stamps	Headers	Machines
" Trollies	Horse Hoes	Spraying Machines
" Tubs	Huskers	Spraying Materials
" Workers		Spraying Pumps
Champion Knife	Incubators	Steam Chaff Cutters
Grinders	Kaffir Hoes	Steam Ploughing
Cheese Fillers	Kaffir Picks	Plant, including
" Hoops	Kibbling Machines	Engines
" Moulds		Sterilizers
" Presses & Pans	Land Rollers	Stump Pullers
" Scrapers		Straw and Wind
" Testers		Stackers
" Vats	Maize Husking and	Straw Trussers
Cream Separators	Shelling Machines	
Corn Drills	Manure Spreaders and	Threshing Machines
Coolers, Milk	Distributors	Tobacco Planters
Corn and Cob Grinders	Mealie Binders	Trek Tows, Yokes
Cotton Baling Presses	" Grinders	and Shackles
and Gins	" Headers	
Cotton Planters	Milk Buckets	Weeders
Curd Buckets	" Cans	Winnowing Machines
" Forks	Milk & Cream Testers	Wheat Strippers
" Knives	" Pans	Wheat Harvesters
" Mills	" Pasteurizers	

EXPORT OF MAIZE OVERSEA. BEYOND SOUTH AFRICA.

THE FOLLOWING ARRANGEMENTS ARE IN OPERATION
FOR THE EXPORT OF MAIZE OVERSEA,

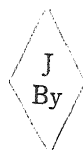
1. The Railway Administration undertakes, subject to the following conditions, to receive consignments of maize (mealies) at any station or siding on the main or branch lines between Beira, Nyamandhlovu and Plumtree (both inclusive), dispose of same, on account of sender, in England, at market price on arrival, and remit the amount realised by the sale of the maize, less 3/- per bag to cover Rail Carriage,

Shipping Charges, Wharfage, Customs Entries, Stamps, Ocean Freights, Commissions and other charges (not sampling or superintendence) incidental to the conveyance and disposal of the maize on the English market.

- (a) The amount remitted to sender will be the price obtained on disposal, less 3/- per bag, including incidental market superintendence charges.
- (b) The Administration does not undertake to land maize on the English market on any particular date, but the most expeditious transit reasonably and economically possible, will be arranged, and the maize will be disposed of in England as quickly as may be consistent with securing satisfactory prices at the rates ruling at the time.
- (c) Senders desiring an advance on their shipments may have same arranged on application being made to the Railway Chief Accountant, Bulawayo, or Stationmaster at point of despatch. The maximum amount advanced will be approximately one-half the current value, as ascertained from the latest market quotations; such advances will bear interest at the rate of 6% per annum. The balance due after the sale of the maize, *i.e.*, amount realised, less 3/- per bag as above, less advance (if any) and interest, will be remitted to the Sender by the Railway Chief Accountant or Stationmaster with as little delay as possible.
- (d) The Railway Administration will be responsible for ordinary risks, but against any special risks, such as heating, weevils, etc., consignors must insure themselves against such risks.
- (e) Maize will be sold on weight as ascertained and certified at port of shipment; but, if necessary, an allowance of 2 per cent. for sifting and drying out in transit thereafter is claimed, should it appear that such loss has occurred.

- (f) The name or private code of the sender, together with the name or code mark of Station or Siding despatched from, as well as a letter indicating the Class of Maize, must be shown on the bags.

W	will indicate	White	} Maize
FY	"	Flat Yellow	
RY	"	Round Yellow	
M	"	Mixed	



E.G.—A bag of White Maize say from Jones, Bulawayo, would be marked ...

W

- (g) Consignor must perform loading at Sending Station.

GENERAL.

MINIMUM CONSIGNMENTS.—The minimum number of bags per consignment which will be accepted for export is 100 bags.

BAGS.—All bags must be new, double-sewn, and of 200lbs. full weight nett. To ensure safe transit not less than 2 1/2 lb. bags must be used.

GRADING.—All maize for export will be graded at port of shipment. Each bag will be marked according to grade. Maize not coming up to standard will be marked "Below Grade." Maize which is not authorised by senders to be examined and marked by the officer appointed for the purpose at port of shipment will not be allowed the benefit of the export rates, but will be subject to the ordinary Railway Tariff. Samples may be obtained from the Department of Agriculture, Salisbury, at a cost of 1/- per sample.

WEEVILS.—Maize found to be weevily before shipment will be immediately sold on account of whom it may concern, and will on no account be shipped. Moreover, where weevils manifest themselves prior to grading, ordinary and not export rate will be levied.

LIVESTOCK RATES.

Full ordinary rates for livestock, based on 10 head of large stock, or 60 head of small stock, in a short truck from certain Stations in Cape and Orange Free State Provinces to certain Stations in Rhodesia. Calves, three months or over and under eighteen months old, are charged as a large animal per two heads.

FROM	To BULAWAYO						To GWELO						To SALISBURY						To UMTALI					
	Large Animals			Small Animals			Large Animals			Small Animals			Large Animals			Small Animals			Large Animals			Small Animals		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Port Elizabeth ... <i>(via</i> Cookhouse & De Aar)	19	15	2	22	11	0	23	7	2	26	3	0	28	3	2	30	19	0	36	13	2	39	9	0
East London ... <i>(via</i> Stormberg & De Aar)	20	10	2	23	8	6	24	2	2	27	0	6	28	18	2	31	16	6	37	8	2	40	6	6
Capetown ...	21	2	8	24	2	8	24	14	8	27	14	8	29	10	8	32	10	8	38	0	8	41	0	8
Bloemfontein ... <i>(via</i> Kimberley)	14	1	0	15	8	6	17	13	0	19	0	6	22	9	0	23	16	6	30	19	0	32	6	6
Kimberley ...	12	7	8	13	15	2	15	19	8	17	7	2	20	15	8	22	3	2	29	5	8	30	13	2
Vryburg...	9	14	4	11	1	10	13	6	4	14	13	10	18	2	4	19	9	0	26	12	4	27	19	0

Reduced Rates on Livestock for Breeding Purposes.—Livestock imported into Rhodesia for breeding purposes, or for *bona fide* work on a farm, are allowed a reduction of 50 per cent. over the lines from Vryburg or Beira, as the case may be. The South African Railways (Cape Province) allow a reduction of 25 per cent. on breeding stock sent over their lines to Rhodesia if belonging to and consigned to farmers. Under no circumstances will the concessions be allowed over any of the Railways for Livestock imported for slaughter or commercial transport. Application for certificates relating to the importation of Livestock should be made to the Director of Agriculture, Salisbury, or to J. Woodin, Esq. (Examiner of Stock for Southern Rhodesia), P.O. Box 502, Port Elizabeth. In cases where certificates are not handed in at sending Stations with the Livestock full ordinary rates are charged, and upon application for rebate, ten per cent. (maximum £1 minimum 1s.) is deducted from the amount of rebate. Importers should therefore obtain and hand in the certificates with the Livestock at sending Stations, so that correct rates will be entered in the first instance.

Wool Industry.

INYANGA SALES.

We have received from Mr. Wienholt of Inyanga, the following particulars of prices obtained in London, for his latest clip of scoured wool :

Class.	Bales.	Nett Weight.	Price per lb.
			Pence
Ewe, prime fleeces	7	1911	14
Huggetts „ „	2		14
Wethers „ „	3	670	13
Prime pieces	3	640	14½
Second pieces	4	848	14
Bellies	2	446	14
Ewes Seconds fleeces	3	605	12½
Locks	3	690	12
Rams	1	247	11½

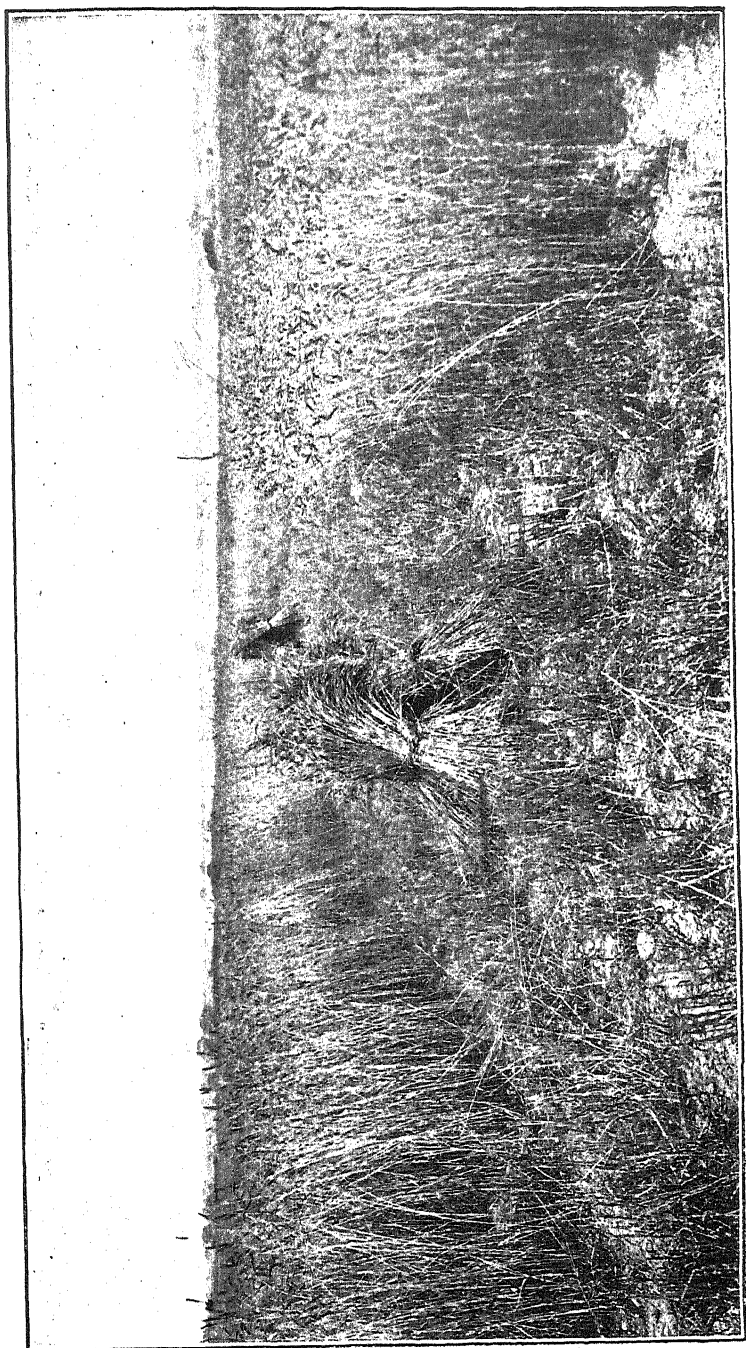
We may add for the benefit of intending exporters, that the railage to Beira for wool, is at the rate of 5d. per ton of 2,000 lbs. per mile, with 5/- terminals, and the frieght 70/- per long ton, weight.

Notes on Winter Cereals without Irrigation.

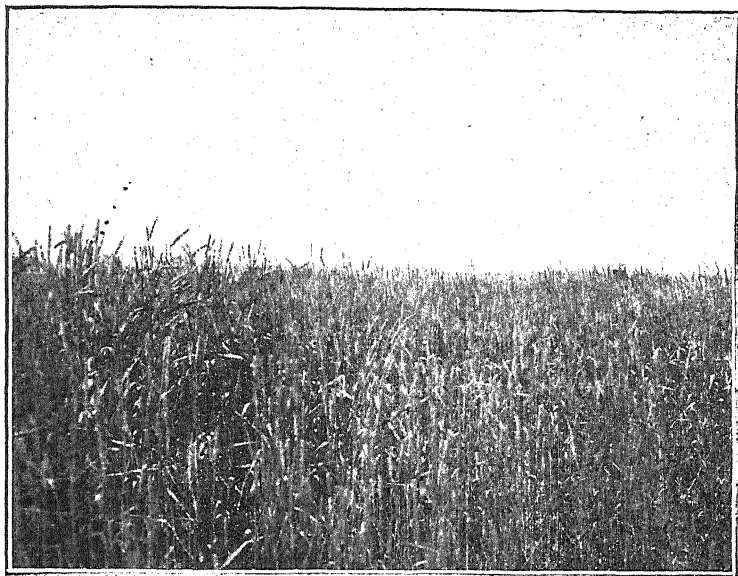
By H. GODFREY MUNDY, F.L.S., Government Agriculturist
and Botanist, and J. H. HAMPTON.

The movement towards extensively utilising the naturally moist soils of Southern Rhodesia for the production of winter cereals should in the near future alter very considerably the general methods of farming practiced throughout the Territory. Irrigation schemes are often beyond the financial means of the private farmer, nor owing to the flow of our rivers, is direct furrow irrigation too frequently practicable. The possibility of growing some form of winter cereal crop on the great majority of farms seems conclusively proved, and a moment's reflection will indicate what prospects are thus opened up. The fact that a farmer can produce both summer and winter crops means that his capital can be turned over more rapidly. His risks are lessened since "all the eggs are not in one basket," and if he can depend with moderate certainty on both crops he can afford to plant the staple summer crop less extensively, and his labour requirements can thus be reduced. With the intensive cultivation of smaller acreages of summer crops should come an appreciation of the term "high" farming, and there are few who will question that by better farming our acre yields may in many cases be increased by anything from two to five fold.

The farmer whose land is suitable to wheat will not only be able to grow it for his own consumption, but gradually as the practice extends a portion at least of the large annual sum which leaves the country for imported wheat products, will be retained. The settler who, owing to remoteness from railway, is unable to compete with forage growers more favourably situated, and whose soil is unsuited to wheat, may direct his attention to producing malting barley, rye, or



Early Guayas Wheat, grown on moist land without irrigation.



Golden Ball Wheat, on naturally damp land without irrigation.



*Mr. van der Merwe's crop of Algerian Oats.
Early Potatoes in the background.*

a sound feeding oat, which can always profitably compete against the often inferior article which is now imported. The provision of green forage crops in winter is of the utmost importance to all-the-year-round dairying and forms an invaluable addition to the succulent food hitherto available, viz., pumpkins, mangels and silage. Not to forget the "gentleman who pays the rent," after the green fodder has been cut and soiled to the dairy cattle, pigs can receive their share of succulent feed by being run on the stubble. Pig raising goes hand in hand with dairying, and the use of the skim or buttermilk combined with barley, wheat sharps and rye meal, in conjunction with the varied summer crops which can be grown, should guarantee a production of pig products second in quality to none.

It will therefore be admitted that by utilising soils naturally retentive of moisture, for winter cereals, no matter whether it is grain production or a constant supply of green or dry fodder that is aimed at, the present methods of cropping may to a great extent be improved upon and "mixed" farming may be established on a sounder basis than heretofore.

During the past winter a considerable acreage of this class of soil throughout Rhodesia was put under cereal crops with seed supplied by the Agricultural Department, under the usual terms of co-operative experiments, and the reports which have already been received indicate the value of such soil, especially to those farmers whose main lands are not suitable for the production of heavy crops of maize. Some of the experiments during the past season have been unsatisfactory, whilst others have only been moderately successful, but the majority of the reports foretell a great future for this method of cropping. In almost all cases of failure, a sufficient reason has been forthcoming, either in unsuitability of soil and time of sowing or in the ravages of buck, birds and vermin.

A few reports have also been received from those who have carried out extensive experiments independently of the Department, and without exception these all show satisfactory results, from which it seems that the larger the acreage the better the crop, since the ravages of birds and buck are

not so marked as on a small plot of a quarter of an acre or thereabouts. Many more reports have yet to come forward, but the following details which will give a fairly good idea of what has been done in different districts and on various classes of soil are published at this date, in order to reach the notice of those interested, and thus to give an impetus to further experiments during the coming winter.

EARLY GLUYAS WHEAT.—Seven reports on this variety have been received of which five are satisfactory. Two failures are reported from Bubi and Gutu districts, where in the former Mr. Paley found the crop a complete failure, and in the latter Mr. Smart of Felixburg, only obtained 30 lbs. of seed from a quarter acre sown. The lateness of sowing (April 3rd and May 31st) may partly account for these results, beside which Mr. Smart was under the disadvantage of unsuitable soil, which was very wet when the seed was sown, and became hard and baked shortly after "brairding." Of the other reports the *lowest* yield, of just over three bags per acre comes from Mr. Will of Sandown Siding, from seed sown on the 16th April on a black, manured vlel on the granite area. Messrs Sworder Bros., and Mr. Dyke obtained yields at the rate of three and a half and four bags respectively from seed sown in drills on the black alluvial soil of the Hartley district. The samples of the crop sent in by these gentlemen were excellent, both as regards size of ear, and size and quality of grain. Mr. Gordon of Lomagundi, on naturally moist and unmanured peaty soil reaped at the rate of four bags per acre, from seed sown broadcast on the 15th April, although considerable damage was done to the crop by rats. In his report Mr. Gordon states that the yield would have been heavier had the seed been sown a month earlier. The highest yield of all, however, comes from North Eastern Rhodesia where Mr. Bruce-Gray on a field measuring four-fifths of an acre, reaped over five bags of seed from 40 lbs. sown on June 12th, and is most sanguine of the success of this variety grown on a large scale. Mr. H. Michell of Rusapi has grown Gluyas wheat fairly largely during the past winter on the granite sand of his farm Lesapi Cave, and has had moderately satisfactory results although considerable damage seems to have been done by frost and birds. Mr. Fischer, of Headlands, who has advocated this method of cropping for several seasons, has also had most gratifying

results during the past winter, with the same variety, grown on a considerable scale, and it would appear that Gluyas wheat under ordinary conditions and with proper attention is likely to prove one of the most suitable varieties for sowing on moist land without irrigation. Some experimenters have drawn attention to the havoc wrought by the small birds, and under such conditions a strongly bearded wheat such as Zwartbaard may perhaps be more advantageous.

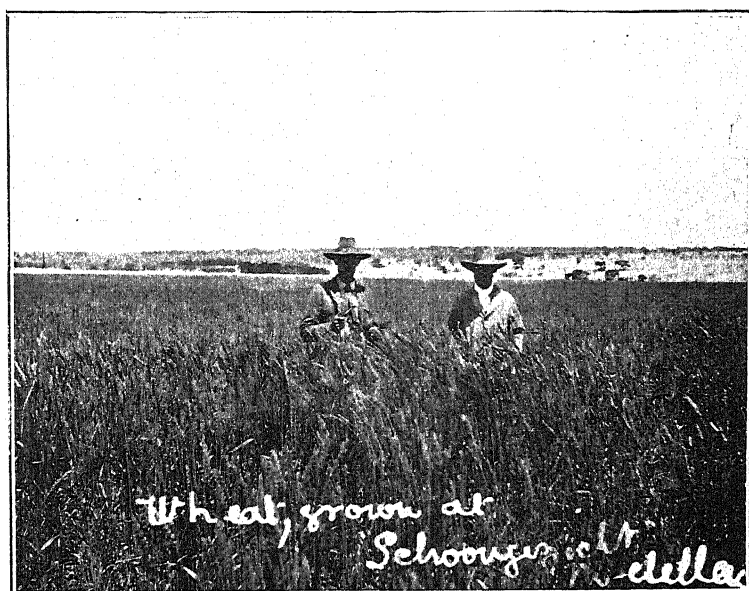
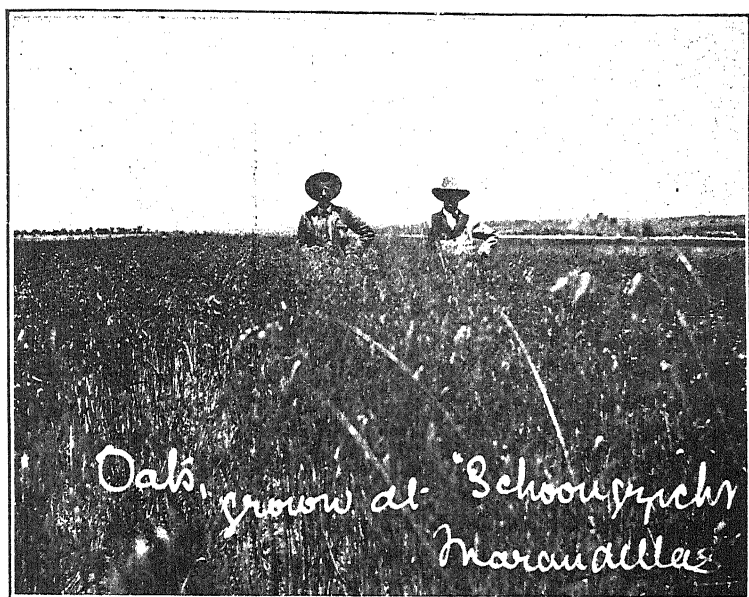
GOLDEN BALL WHEAT.—Of the ten reports on this variety three show failures and two others only poor results. The rest are fairly satisfactory, recording yields at the rate of from one and a half to seven bags of seed per acre. As in the case of Gluyas, Mr. Paley's failure may be attributed to lateness of sowing, whilst Mr. Harvey of Odzi, found his red soil too shallow and too dry to bring the crop to maturity. Mr. Michell's crop did well in the early stages of growth, but was killed by rust and frost before ripening. Poor results are reported by Messrs. Sworder Brothers, Hartley, and Mr. Smart, of Felixburg. Mr. Horrie of Umtali, reaped 65 lbs. of seed and 300 lbs. of straw from 15 lbs. sown broadcast on March 16th amongst his maize, which was then receiving the last cultivation. Mr. Gordon, Lomagundi, from seed sown about the middle of April, obtained a yield at the rate of three bags per acre, whilst Mr. Will, of Sandown, and Col. Leonard, Gatooma, had each a yield at the rate of four bags per acre, from seed sown at the same time on lightly manured granite vleis and unmanured black alluvial soil respectively. The best report comes from Mr. Hallam, Umvuma, whose yield at the rate of seven bags per acre is quite encouraging. In his remarks, Mr. Hallam states that this variety does better on high well-drained lands, as it is inclined to rust where the soil is too damp. A special report has been received from Mr. Willmot, who has successfully grown some ten acres of Golden Ball and Els wheat on the granite soil of his farm, "Schoongezicht," Marandellas. The seed was sown on June 10th, and the crop reached a height of four and a half feet, with long and well-filled ears, (see illustration), but as the seed had not been threshed when the report arrived the yield was not included. Mr. Willmot states that although he has had considerable experience of wheat farming in Cape

Colony, he has never seen a better crop, and he has no hesitation in predicting a great future for wheat in the sandy vleis of Rhodesia.

Although it is evident that Golden Ball is not generally so successful as Gluyas, yet under certain conditions it may also prove a useful variety for winter sowing, especially on high-lying granite vleis where the drainage is good.

BOBS WHEAT.—Of this variety good reports come from Messrs Gordon, Lomagundi; Michell, Rusapi; and Frankis, Victoria, whilst moderately satisfactory results are reported by Messrs. Will, Sandow Siding; Bruce-Gray, North Eastern Rhodesia; and Hallam, Umvuma. The two last named comment on the fact that although in the field Bobs looked better than Gluyas and Golden Ball, both as regard straw and ear, yet the acre yield of grain was most disappointing, being only a little over a third of what was obtained from the other two varieties. Owing to the flooding of his ground which destroyed a great proportion of his crop, Mr. Will only reaped 85 lbs. of seed from a quarter acre plot. Mr. Gordon obtained 600 lbs. and Mr. Michell 700 lbs. of clean seed per acre from the same class of soil as produced the other varieties grown by these gentlemen, whilst Mr. Frankis reaped at the rate of five sacks per acre from seed sown broadcast on May 23rd on moist granite soil which had been lightly manured the previous season. The fact that no absolute failures are reported with this variety seems to testify to its hardiness and to indicate that it is worthy of more extensive trials.

MEDEAH AND KLEIN KOREN WHEATS.—Of the three reports which have been received on these two varieties, there is only one, that of Messrs. Sworder Brothers, which shows satisfactory results, and even these gentlemen give nothing definite, except that both seem worthy of further trial. Mr. Gordon only reaped half a bag of each, from quarter acre plots, on heavy black soil, whilst Mr. Smart, of Gutu, reaped 20 lbs. of each from 15 lbs sown on the 31st of May. The lateness of sowing, however, may account to some extent for the smallness of yield. With so few reports to hand it is difficult to express any opinion regarding the suitability of either of these two varieties. Two other special reports on



Winter Cereals.



wheat have been received, but the varieties tested are not named. The one comes from Mr. Power, Silver Bow, Rusapi, who reaped thirty bags of seed from 10 acres of unmanured granite soil, and the other from Mr. R. N. Hughes, Victoria, whose five acres produced twenty four sacks of clean seed.

From all districts come complaints regarding ravages wrought on the wheat crop by buck and birds, and in all cases the yields would have been better, but for these pests. Bearded wheats seem to resist the depredations of birds better than the beardless varieties, but of those so far tested, Gluyas, Bobs and Golden Ball, although beardless seem to have given the most satisfactory results.

ALGERIAN OATS.—Algerian oats have been grown extensively throughout Southern Rhodesia during the past few seasons, and it is not surprising therefore to find that the reports which have been received are all satisfactory. Mr. Williams, of Syringa, was successful with this variety alone, although, also trying Sidonian, New Zealand and White Tartar oats under the same conditions, whilst on the adjoining farm, Holdstock, from a quarter of an acre of lightly manured black granite vlel, Mr. Engelbrecht obtained 70 lbs. of seed and 700 lbs. of straw. Mr. Engelbrecht especially recommends this variety both as regards weight of seed and quality of forage. Mr. Hallam, Umvuma, and Mr. Frankis, Victoria, had each a yield of 2,000 lbs. per acre of oat hay from seed sown on the 13th March, and 23rd May, respectively, on lightly manured land. Mr. Frankis is of the opinion that his crop would have been better if the seed had been sown a month or two earlier.

On the damp granite soil of the Somabula flats, Mr. Ferguson of Penders and Mr. van der Merwe of Buttercup, produced excellent crops of Algerian Oats. From two and a half bags of seed sown at the end of February, the former reaped 1,500 lbs. of oat hay, which he disposed of in Bulawayo at a remunerative price. Mr. van der Merwe had not reaped his crop when the report arrived, but his crop, which was seen by the writer, should be quite equal to that of his neighbour.

With such favourable results from all districts it would appear that Algerian oats may be accepted as a suitable crop both for seed and forage. Its slowness in maturing is a drawback, but if the seed is sown about the end of February the crop should be ready for cutting about the middle of September, when forage is most valuable to those who have dairy cattle and other stock to feed.

SIDONIAN OATS.—Nine reports on this variety have been received of which five are favourable. Three of the experimenters—Messrs. Williams, Syringa; Paley, Lochard; and Harvey, Umtali—report failures, whilst Mr. R. W. Twilley, of Hunters Road, found that only on the ridges did his crop do well, the straw averaging three feet in height and the ears from nine to twelve inches in length. On the low-lying, excessively wet ground the crop proved a failure. Mr. Heron, of Headlands appears to have had a fair crop of this variety as well as of New Zealand oats and Early Rye, but kept no record of the weight of his crop, as he fed all three as green fodder. In the Umtali district, Mr. Horrie, of Cairndhu Estate, sowed 16lbs. of seed broadcast between rows of maize, and reaped 60lbs. of seed and 400lbs. of straw. From the same quantity of seed and on black vleis soil, Messrs. Swarder Bros., of Hartley, reaped 400lbs. of oat hay. Unevenness in ripening, however, prevented them from obtaining any seed. On black granite soil which had been manured the previous year, Mr. Frankis, of Victoria, obtained a yield of oat hay at the rate of 2,000lbs. per acre, and would have done better had it not been for the ravages of buck, whilst 50lbs. of seed and 700lbs. of oat hay were reaped by Mr. Engelbrecht, from a quarter acre plot on the same class of soil.

In the December issue of the AGRICULTURAL JOURNAL there appeared a photograph of a field of about fifty acres of Sidonian oats grown on Mr. Kirkman's farm, "Stamford," without irrigation. Although excellent as regards stand and weight of hay, this crop proved to be both coarse in straw and light in ear, a disadvantage under which this variety often labours and one which tells against it as a fodder when compared with Algerian oats.

It may be added that the Sidonian promises well as a

summer oat, but more extensive trials must be carried out before it can be recommended as a reliable summer crop.

On the Government Experiment Farm, Gwebi, excellent crops of Algerian and Sidonian oats and early rye were obtained from seed sown at the beginning of March, in heavy black soil on the banks of the Gwebi river. The land was once ploughed in January and then disc harrowed, and was therefore in very imperfect condition. The crops were reaped in August and though in the case of the Sidonian oat the heads were rather light, the forage generally was of excellent quality and proved invaluable for winter feed. The yield of oat hay in the case of both varieties was slightly over one ton per acre.

NEW ZEALAND OATS.—Of the six reports received on this variety, two are satisfactory and three others moderately favourable. Mr. Williams, of Syringa, reports a complete failure of his crop owing to the unsuitability of his soil. Although his seed was sown on the 24th February, Mr. Dyke, of Hartley, found that his soil did not retain enough moisture to bring the crop to maturity, and it was therefore cut down in June as green fodder. Mr. Smart, of Felixburg, reaped a fair crop of oat forage from seed sown on red soil on the 31st May. Satisfactory reports come from Col. Leonard, Gatooma, and Mr. Engelbrecht, Syringa, whose yields at the rate of about two tons of oat hay per acre are extremely good. Mr. Engelbrecht, however, complains of the coarseness of the straw of this variety also.

WHITE TARTAR OATS.—None of the reports on this variety can be considered satisfactory, although Messrs. Sworder Bros. speak favourably of the quality of the fodder and think that early sowing would be advantageous. Mr. Harvard, of Headlands, had good results from the seed which fell on ant-heaps, but on the poorer soil of the rest of his land the crop proved a failure. Mr. Frankis, of Victoria, also had poor results with his White Tartar, although he was successful with both the Algerian and Sidonian varieties.

It must be pointed out, however, that the New Zealand and White Tartar oats are naturally coarse strawed, robust

growers unsuitable for forage and grown primarily with the object to producing a good feed oat.

Mr. Willmot of Marandellas, kindly forwards a special report on a crop of oats grown by him, from seed sown on June 3rd, on granite soil, which had been manured the previous year. He gives no particulars as regards the yield, but states that the crop reached a height of four feet eight inches, and formed long and heavy ears—the grain being hard and well-formed (See illustration).

NEPAL AND CHEVALIER BARLEY have been tried both as a green crop and for grain production. Twelve reports have been received. It has proved suitable in several districts as a quick growing forage crop.

The reports on barley as a seed crop are not altogether encouraging, but further trials are warranted before definitely expressing an opinion as to its suitability as a winter grain. Now that the operations of the local brewery have been extended, a large demand will arise for malting barley, and it is to be hoped that this cereal will prove as successful as either wheat or oats when grown without irrigation.

EARLY RYE.—Of the five reports which have been received on Early rye, one is very favourable and the rest are fairly satisfactory. Messrs. Swarder Bros. give no yield, but state that the straw on their plot stood 3 feet 6 inches in height, and that the ears and grain were good. Mr. Frankis, Victoria, and Mr. Harvard, Headlands, both consider that rye can be profitably grown in winter without irrigation, if a market or use for the crop were assured, whilst Mr. Engelbrecht found his crop did well on manured granite soil. The best report comes from Mr. Hallam, Umvuma, who sowed 20lbs. of seed on the 15th March, on well manured and well tilled soil. The rye reached a height of six feet by the 1st June, when it was cut down and fed to horses as green fodder. Afterwards the crop was allowed to mature, and on the 15th October, a yield at the rate of six bags of clean seed per acre resulted. Messrs. Fischer Bros., of Headlands, have also grown rye successfully for several seasons, without irrigation.

MAMMOTH LATE.—Five reports on Late rye have also been received, but only two indicate satisfactory results. Complete failures are reported by Col. T. Leonard, Mr. Horrie and Mr. Dyke. Mr. Harvey, of Umtali, had a fair crop of green fodder from seed sown on red soil on the 3rd June, but the lateness of sowing and dryness of soil prevented the grain from ripening properly. Mr. Engelbrecht, who reaped 45lbs. of seed from a quarter of an acre of manured granite soil, found that the crop required seven months to reach maturity.

The results of the experiments here recorded are not in themselves of a uniformly convincing nature, but due consideration must be given the fact that the majority of the experimenters had had no previous experience of this system of cropping. Many of the crops referred to were inspected by the writers, and more often than not, the most suitable soil had not been selected. Further, on many of the farms the land had been very indifferently prepared, and whereas some was too dry and shallow other again was excessively water-logged by the late autumn rains. The increase in yield due to the use of manure even when applied to a previous year's crop is of particular importance, and there is little doubt that, in order to obtain the best results, an application of either kraal or artificial manure is necessary on most soils. With one exception all the crops reported on were broadcasted, and there is no doubt that a better germination and a more regular ripening will be obtained where drilling is practised.

It must not be inferred that the methods of cropping here outlined are recommended in preference to irrigation farming. It is claimed, however, that the results thus far obtained, prove conclusively that with intelligent handling and where irrigation is not possible, the area of soils, naturally retentive of moisture, provide a good substitute and an asset of wide-spread value to the country.

Dipping and Tick-Destroying Agents.

By Lieutenant-Colonel H. WATKINS-PITCHFORD,
Government Bacteriologist, Natal.

(Reprinted from the "Agricultural Journal" of the Union of South Africa, by kind permission of the Secretary for Agriculture.)

(Continued from December Number).

SCHEDULE I.

Shortest Periods for Engorgement of the Larva and Nymph of the Brown Tick.

Preliminary observations were made upon the rabbit by reason of the ease with which this tick was observed to attach itself.

Four rabbits were infested with a number (some thousands) of larvae each. These ticks were placed on their host at 11.45 a.m. on 15th January, and it was found that engorged forms first commenced to loosen their attachment at 11.45 a.m. on 18th January, a period of seventy-two hours precisely.

Control observations were made on cattle, a large number of larval ticks being placed upon the ears of beasts, over which bags were then tied. Several engorged forms were found in the bags as early as sixty-eight hours (10.15 a.m. 15th March to 6 a.m. 18th March), a result which there is no reason to doubt frequently occurs in the case of infected cattle under natural conditions.

In the case of nymphs, observations similar to above were made upon rabbits, the shortest period of engorgement noticed being seventy-one and a half hours.

In the case of cattle, no engorged nymphs could be recovered until the eighty-fourth, while, in repeat experiments, the time was still further lengthened, the period apparently

being dependent upon the mean temperature, as, in one case observed during the cool days of early April, no engorgement took place for over five days, although attachment was effected at once. The main deduction from the above observation is that where dipping is relied upon as a check to East Coast fever, such dipping must be made at intervals of not longer than seventy-two hours, if the escape of *all* forms of infectious ticks is to be prevented.

SCHEDULE II.

Showing Details of Adjustment of "Three-day" Dip.

The above schedule shows the manner in which the various component parts of the dip were arranged, and also the manner in which the solutions of varying strengths were tolerated by the cattle immersed in them. It will be noticed that three estimations of arsenical strength were experimented with, namely, three-quarters, one-half, and five-twelfths—the strength of the "Laboratory Dip." Further dilutions were also tried, namely, one-third and one-quarter of the strength of this original dip, but it was found that these latter dilutions were not efficient in practice.

The main observations therefore, were confined to the above strengths, which correspond to $6\frac{3}{4}$ lb., $4\frac{1}{2}$ lb., and $3\frac{1}{2}$ lb. respectively of standard arsenite of soda to 400 gallons of water, etc.

A further variation was introduced by omitting, in certain cases, the paraffin and soap mixture, in order to test the suitability of arsenite of soda alone when used in such weak solutions.

Further, it will be noticed from the above table that certain dippings were practised at intervals of forty-eight hours (one clear day), while in others the interval was seventy-two hours (two clear days).

Reference to the table will show that the $6\frac{3}{4}$ lb. (which is called the three-quarter strength, as compared with Laboratory Dip) when applied every two clear days, resulted in the casting, after the sixth immersion, of the five animals shown, and

that they had to be allowed a fortnight's interval before dipping could be recommenced; further experiment with this strength, and at this interval, was, therefore, discontinued.

In the case of $4\frac{1}{4}$ lb. to 400 gallons (so-called one-half strength), it will be seen that estimations were made at intervals both of one clear day and two clear days, and also that separate experiments were made at this arsenical strength by omitting soap and paraffin from the dipping fluid. In these latter cases (minus soap and paraffin), it will be seen that the half strength ($4\frac{1}{4}$ to 400 gallons) necessitated the casting of the experimental animals for some period after nine or ten immersions, owing to cracking of skin, which condition was more pronounced in the animals dipped at only one-day interval. Where, however, the full formula was used, it will be noticed that it was only necessary to omit two of the routine dippings at the one-day interval, and only one dipping at the two-day interval, while the omission in this latter case was not imperative.

After a number of dippings, varying, in the case of the one-day interval, from 17 to 19, and in the case of the two-day interval dip from 11 to 12 immersions, the whole herd was passed with regularity through a dip containing 4lb. of arsenite of soda to 400 gallons, together with an adjusted proportion of soap and paraffin (see Schedule VII), and it is this composition which is referred to in the foregoing pages as the "Three-day" Dip. Reference to frontispiece will show that between sixty and seventy dippings at this interval have been tolerated without any loss of condition.

SCHEDULE II.
Showing Details of Adjustment of "Three-day" Dip.

STRENGTH OF DIP.	No. of Beast.	OCTOBER.							NOVEMBER.						
		9	12	15	18	21	24	27	30	2	5	8	11	14	17*
63 lb. Arsenite of Soda—with Soap and Paraffin—to 400 gallons (3-strength).	85	X	X	X	X	X	X	X	0	0	0	X	X	X	X
	86	X	X	X	X	X	X	X	0	0	0	X	X	X	X
	87	X	X	X	X	X	X	X	0	0	0	X	X	X	X
	88	X	X	X	X	X	X	X	0	0	0	X	X	X	X
	89	X	X	X	X	X	X	X	0	0	0	X	X	X	X
41 lb. Arsenite of Soda—with Soap and Paraffin—to 400 gallons (3-strength).	65	—	X	X	X	X	X	X	X	X	X	X	X	X	X
	66	—	X	X	X	X	X	X	X	X	X	X	X	X	X
	67	—	X	X	X	X	X	X	X	X	X	X	X	X	X
	68	—	X	X	X	X	X	X	X	X	X	X	X	X	X
	69	—	X	X	X	X	X	X	X	X	X	X	X	X	X
	70	—	X	X	X	X	X	X	X	X	X	X	X	X	X
	71	—	X	X	X	X	X	X	X	X	X	X	X	X	X
	72	—	X	X	X	X	X	X	X	X	X	X	X	X	X
41 lb. Arsenite of Soda to 400 gallons (no Soap or Paraffin)	75	—	X	X	X	X	X	X	0	X	X	X	X	X	X
	76	—	X	X	X	X	X	X	0	X	X	X	X	X	X
	77	—	X	X	X	X	X	X	0	X	X	X	X	X	X
	78	—	X	X	X	X	X	X	0	X	X	X	X	X	X
	79	—	X	X	X	X	X	X	0	X	X	X	X	X	X
	80	—	X	X	X	X	X	X	0	X	X	X	X	X	X
	81	—	X	X	X	X	X	X	0	X	X	X	X	X	X
	82	—	X	X	X	X	X	X	0	X	X	X	X	X	X
	83	—	X	X	X	X	X	X	0	X	X	X	X	X	X
	84	—	X	X	X	X	X	X	0	X	X	X	X	X	X

The X indicates a dipping; the O the omission of the same.
* From this date all the cattle were dipped regularly in "three-day" dip at intervals of 72 hours.

SCHEDULE II. (continued).

STRENGTH OF DIP.	No. of Beast.	OCTOBER.										NOVEMBER.										
		8	10	12	14	16	18	20	22	24	26	28	30	1	3	5	7	9	11	13	15	17
4½ lb. Arsenite of Soda—with Soap and Paraffin—to 400 gallons (½-strength)	90	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	91	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	92	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	93	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	94	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4½ lb. Arsenite of Soda to 400 gal- lons (no Soap or Paraffin)	95	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	96	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	97	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	98	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	99	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	36	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	42	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	45	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3½ lb. Arsenite of Soda—with Soap and Paraffin—to 400 gallons (⅕ strength).	63	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	64	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	100	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	101	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3½ lb. Arsenite of Soda to 400 gal- lons (no Soap or Paraffin)	102	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	103	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	104	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	105	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3½ lb. Arsenite of Soda to 400 gal- lons (no Soap or Paraffin)	106	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	107	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	108	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	109	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

The X indicates a dipping; the O the omission of the same.
 * From this date all the cattle were dipped regularly in "three-day" dip at intervals of 72 hours.

SCHEDULE III.

Lethal Effects of "Three-day" and "Laboratory" Dips on Distended Female Brown Ticks.

It will be observed that these observations were based on the effect exerted by three different strengths of dip, namely, one-quarter strength ($\frac{1}{2}$ lb. arsenite of soda to 100 gallons), one-half strength (1 to 100 gallons), and full strength ($2\frac{1}{2}$ lb. to 100 gallons), and that the results show that 1 lb. to 100 gallons is sufficient to prevent the eggs laid from hatching out, while, in some cases, the females died before commencing the process of laying. In the case of the weaker dip, it will be noticed that development was not certainly arrested, but that the females laid eggs, which, in one or two cases, succeeded in hatching out. In the case of the full strength (Laboratory Dip), out of a test of fourteen ticks, all were killed by the dip, although two survived long enough to commence the laying of a few eggs, which were unable to hatch.

In some of the above cases, where only one-quarter strength was used, it will be noticed that eggs were laid, and development occurred within the same (in some cases to a considerable extent) before the inhibitive influence of the dipping on the parent tick appeared to be exerted. In the majority of cases, however, in which eggs were laid, no commencing development of the egg could be traced.

The effect of the "Three-day" dip (or 1 lb. to 100 gallons), therefore, upon tick life may be judged from the above results.

SCHEDULE IV.

The Effect of "Three-day" Dip at intervals of seventy-two hours upon Adult Tick Life generally.

Ten cattle were taken for a preliminary observation. They were harbouring the numbers of ticks shown below, and were dipped upon 12th January and 15th January, 1911, being kept under conditions which precluded the possibility of further infestation by ticks during this interval.

	12th January.		15th January.		18th January.	
	Number of Ticks.		Number of Ticks.		Number of Ticks.	
	Below Tail.	In Brush.	Below Tail.	In Brush.	Below Tail.	In Brush.
No. 42	2 Alive	18 Alive	0 Alive	6 Alive 7 Dead	0 Alive	0 Alive 2 Dead
No. 67	3 Alive	24 Alive	0 Alive	9 Alive 10 Dead	0 Alive	6 Alive* 2 Dead
No. 68	4 Alive	0 Alive	0 Alive	0 Alive 0 Dead	0 Alive	0 Alive
No. 75	11 Alive	0 Alive	1 Alive	0 Alive 0 Dead	0 Alive 1 Dead	0 Alive
No. 80	1 Alive	8 Alive	0 Alive	0 Alive 0 Dead	0 Alive	0 Alive
No. 81	3 Alive	1 Alive	0 Alive	0 Alive 0 Dead	0 Alive	0 Alive
No. 90	0 Alive	8 Alive	0 Alive	2 Alive 1 Dead	0 Alive	0 Alive 1 Dead
No. 91	4 Alive	39 Alive	0 Alive	17 Alive 2 Dead	0 Alive	4 Alive* 10 Dead
No. 94	3 Alive	10 Alive	1 Alive 1 Dead	4 Alive 4 Dead	0 Alive 1 Dead	0 Alive 4 Dead
No. 95	2 Alive	11 Alive	0 Alive 1 Dead	6 Alive 4 Dead	0 Alive	0 Alive 1 Dead
Totals ...	33 Alive At commencement.	119 Alive	2 Alive 4 Dead	44 Alive 44 Dead	0 Alive 2 Dead	10 Alive* 20 Dead

* See notes.

Total ticks on cattle on 12th January .. 152 alive.

Total ticks on cattle on 15th January .. 46 alive, attached.
48 dead, attached.
58 dead, dropped off.152

Effect of one immersion in "Three-day"

Dip, after 72 hours 30.2 per cent. ticks survive.
31.5 per cent. ticks dead attached.
38.3 per cent. ticks dead dropped off.

Total ticks on cattle on 18th January ..

10 alive.
22 dead, attached.
14 dead, dropped off.

Effect of two immersions in "Three-day"

Dip, after 144 hours 6.5 per cent. ticks survive (see observation below concerning survivors).
46 per cent. ticks found dead.
47.5 per cent. ticks dead dropped off.

It will be seen that the above cattle harboured 152 live ticks at the time of their first dipping. At the end of seventy-two hours 31 per cent. of these ticks were found dead and attached to their hosts, 30 per cent. were alive, while 38 per cent. had died and become detached. A further dipping was then given, with the result at the end of a further seventy-two hours that only ten ticks remained alive. These ten survivors present upon animals Nos. 67 and 91 existed in aggregations or clumps of ticks, which past observation has shown to be much less rapidly affected by the action of the dip than separate ticks. Such collections of ticks are, however, easily detected by reason of their bulk when they exist, and the touching of these masses with a small quantity of ear-dressing mixture will destroy within a few hours all signs of life, though even this procedure is unnecessary by reason of their ultimate death.

A fuller series of observations was then undertaken, comprising 207 computations, details of which, by reason of their length, are not quoted. The result of such extended experiment was found to compare closely with the above figures, the exact percentages being as follows for the end of the seventy-two hours period:—

Second observation:—

Effect of one immersion in "Three-day"

Dip, after 72 hours ...	...	30·7 per cent. alive.
		27·3 per cent. dead, attached.
		42 per cent. dead, dropped off.

In each test it will be observed about 30 per cent. of the ticks are alive at the expiration of seventy-two hours, but many are sick and continue to fall rapidly, irrespective of a second immersion.

The significance to be attached to the temporary survival of a few forms of adult tick life is dealt with in the text of the report.

The increased lethal effect exerted by the "Three-day" dip, when used at forty-eight hours' interval is noticed in Schedule V.

SCHEDULE V.

The lethal effect of dips (one-half and five-twelfths strengths) at intervals of forty-eight hours, showing the increase of efficiency resulting from the addition of soap and paraffin.

All the cattle mentioned below were dipped on 12th November.

STRENGTH OF DIP.	No. of Beast.	12th Nov. No. of Ticks.	13th Nov. No. of Ticks.		14th Nov. No. of Ticks.		Percentage killed.
		Alive.	Alive.	Dead.	Alive.	Dead.	
4 lb. Arsenite of Soda to 400 gallons (<i>no Soap or Paraffin</i>)	95	38	25	13	7	18	
	96	12	4	8	0	3	
	97	35	1	26	0	1	
	98	24	3	21	0	1	
	99	46	18	19	0	12	
		155	51	87	7	35	95.5 % killed.
4 lb. Arsenite of Soda to 400 gallons (<i>with Soap and Paraffin</i>)	90	22	13	9	0	5	
	91	29	18	11	1	7	
	92	17	7	10	0	4	
	93	15	1	14	0	0	
	94	25	14	11	2	7	
		108	53	55	3	23	97.3 % killed.
3½ lb. Arsenite of Soda to 400 gallons (<i>no Soap or Paraffin</i>)	105	13	3	7	1	3	
	106	38	11	26	2	7	
	108	13	3	6	2	1	
	109	14	12	11	1	1	
		78	19	50	6	12	92.3 % killed.
3½ lb. Arsenite of Soda to 400 gallons (<i>with Soap and Paraffin</i>)	100	16	8	6	0	3	
	101	26	7	14	2	6	
	102	23	8	15	0	6	
	103	20	1	8	0	1	
	104	15	8	5	0	5	
		100	32	48	2	21	98 % killed.

A notable feature of the above table is the great increase of destructive effect produced upon the tick where the dippings are given at intervals of one clear day (forty-eight hours). These frequent immersions were continued till the commencement of the above experiment, at which time sixteen dippings had been given (with a short intermission as shown in Schedule II).

Before receiving their final dipping, the animals in question were intentionally infested with numbers of ticks, and on 12th November they were dipped in fluids of two different strengths and composition as shown.

Even where the arsenical content was as low as 14 oz. to the 100 gallons ($3\frac{1}{2}$ lb. to 400 gallons), and where no soap or paraffin was employed, the destructive effect at the end of forty-eight hours equalled 92.3 per cent., which effect was increased by almost 6 per cent. (98 per cent.) by the addition of these agents.

The above results are interesting as showing (a) the possibility of the repetition of the dipping process every forty-eight hours in the "Three-day" Dip, and (b) the greatly increased lethal effect produced by this system of frequent dipping. No alteration, however, is made in the practical application of these observations, inasmuch as our end is attained by the adoption of a system of dipping arranged to meet with exactness the life phases of the tick; and beyond this point it does not seem necessary to go, either in reduction of interval or severity of effect.

SCHEDULE VI.

Observation of the schedule below shows that a distinct repelling or revulsive effect is exercised by the dipping fluid upon the immature forms of tick life, and that—while the hungry adult tick attaches itself freely to even a freshly-dipped beast—a period of immunity is possessed by the animal from the attack of the larva and nymph for a considerable time after immersion.

How long such immunity to attack persists, has not been accurately determined, but it appears to depend to a large extent upon the presence in the coat of the animal of the paraffin component of the dip, the young ticks commencing to attach themselves as this agent becomes dissipated or evaporated from the hair. This period of immunity thus gained—even though it may persist for only a few hours—is of the utmost service in delaying the attachment—and consequent maturing—of the young tick, the destruction of which it is thus possible to accomplish with certainty.

Schedule I shows the possibility of the maturing and escape of the larva in as short a time as sixty-eight hours. Escape of infectious forms of tick life under such circumstances would be possible during the period (four hours) left unprotected between the 68th and 72nd (or dipping) hour, unless a restraining effect was exercised by the dip as shown herewith, by which a temporary immunity to attack is ensured.

OBSERVATIONS ON LARVAE.

Calf (41) sprayed with "Three-day" dipping fluid.

Control calf (147) remained unsprayed.

21st January.—A number of active larvae of the brown tick were placed upon various parts of the body of the above calves (chiefly upon the ears and belly).

24th January (seventy-two hours).—No larval ticks could be discovered upon the control calf. A number of engorging forms present on calf (41).

Repeat Experiment.

Calf (42) dipped in tank.

Control calf (148) remained undipped.

4th February.—A large number of active larvae were placed upon these two calves at the same time and in approximately equal numbers.

7th February (seventy-two hours).—No single live larva discoverable in the coat of calf (42), though a number of dead larvae were present.

On control calf (148) thirty-five to forty larvae were found engorged partially or completely.

OBSERVATIONS ON NYMPHS.

Calf (36) was dipped in tank.

Control calf (149) remained undipped.

25th February.—On this date both these calves were turned into the "nymph enclosure" (see foot note).

After remaining in this enclosure for six or eight hours they were removed.

On examination on 28th February (seventy-two hours after exposure) showed a large number of nymphs beginning to fill upon calf (149), while upon calf (36) only one could be discovered attached to the ear.

OBSERVATIONS ON ADULT FORMS.

Four beasts (two recently dipped and two undipped) were turned into a tick-infested paddock. After twelve hours' grazing they were examined and the numbers of ticks present upon the recently-dipped cattle exceeded those upon the undipped—a somewhat unexpected result. The numbers of ticks upon the previously-dipped cattle, however rapidly decreased owing to the exertion of the poisonous “residual” effect.

The general conclusion from the above experiments, therefore, is, that while recent dipping exerts no restraint upon the actual attack of the adult brown tick, it retards to a marked extent the invasion of the young or immature forms, a conclusion which is confirmed in the experimental results secured by practical tests.

Note.—“*Nymphal Enclosure.*”

This enclosure consisted of a wide circle about 40 yards in diameter, the walls of which circle were constructed of lengths of roofing-iron joined end to end. In this enclosure innumerable tick eggs were placed under suitable covers. As the larvae hatched out and became hungry, rabbits were placed in the enclosure. The larvae were found to attach rapidly and in great numbers, and in this way mature larvae were dropped within the enclosure and in due time moulted, stocking the enclosure with thousands of nymphs. A further enclosure was constructed for the production—and maintenance under natural conditions—of large numbers of larvae for the purposes of the experimental work.

SCHEDULE VII.

Details for Preparation of “Three-day” Dipping Fluid.
To mix 400 gallons:—

- 4 lb. Arsenite of soda (80 per cent. arsenic).
- 3 lb. Soft soap.
- 1 gallon Paraffin.

The above ingredients may be mixed in the same manner as directed for the preparation of the Laboratory Dip, which is briefly as follows:—

Dissolve the soap and arsenite separately in a sufficient quantity of hot water; add the soap solution to the paraffin, and beat into an emulsion; then add water to make up to 400 gallons, stirring vigorously the while.

If, however, it is found inconvenient to use heat in the preparation of the dip as above, the dipping fluid may be prepared as follows:—

Take the 3 lb. of soap, place in a bucket, and fill up with water (about 3 gallons); the soap should then be broken by the hand into small pieces. In this way, and by continuous stirring, the 3 lb. of soap can be dissolved in about fifteen minutes. Then add the paraffin as above and heat into an emulsion. Take, in a similar manner, the 4 lb. of arsenite, which will be found to become dissolved in about the same time with constant stirring.

This solution, together with the emulsion, should then be placed in the mixing tank and water added, with constant stirring, up to 400 gallons. This quantity may then be allowed to run into the dipping tank.

If it is desired to mix at one time sufficient materials for the whole contents of a dipping tank of, say, 3,200 gallons capacity, the following method may be adopted:—

Place the total quantity of soft soap—24 lb.—into the 400-gallon mixing tank, and add about 200 gallons of cold water. This mixture should remain—with occasional stirrings—until next day, when the soap will be found to have completely dissolved.

The paraffin (8 gallons) may then be added, and the whole beaten into an emulsion.

Although it will probably be found to be most convenient to dissolve the arsenite of soda in a few gallons of hot water, this may be carried out in a short time with cold water in the following manner:—

Place two or three pounds in a bucketful of water and stir vigorously for five or ten minutes; allow any undissolved

particles to settle, and pour off the liquid into the tank containing the emulsion; then add more arsenite to that remaining in the bucket and fill up with water again, repeating this till all the arsenite has become dissolved.

After thoroughly mixing the emulsion and arsenite solution, the whole may be run into the dipping tank and water added until this is filled to its proper quantity.

In order to ascertain the quantity of dipping fluid removed from the tank by animals at a single dipping, several observations were made with horses, cattle, and sheep.

The following were the average amounts thus carried away after ample time had been allowed for drainage:—

Horses removed on an average $\frac{3}{4}$ to 1 gallon of dip per head.

Cattle removed on an average $\frac{1}{2}$ to $\frac{3}{4}$ gallon of dip per head.

Sheep (shorn) removed on an average 3-10ths of a gallon of dip per head.

Sheep (unshorn) removed on an average 1 gallon of dip per head.

SCHEDULE VIII.

Details for Preparation of "Three-day" Ear Dressing.

Paraffin oil: 1 quart.

Paraffin wax candles, No. 6: 6 to 8.

One quart of paraffin should be cautiously warmed in an open vessel and the candles, broken in small pieces, dropped into the oil, when they will rapidly dissolve.

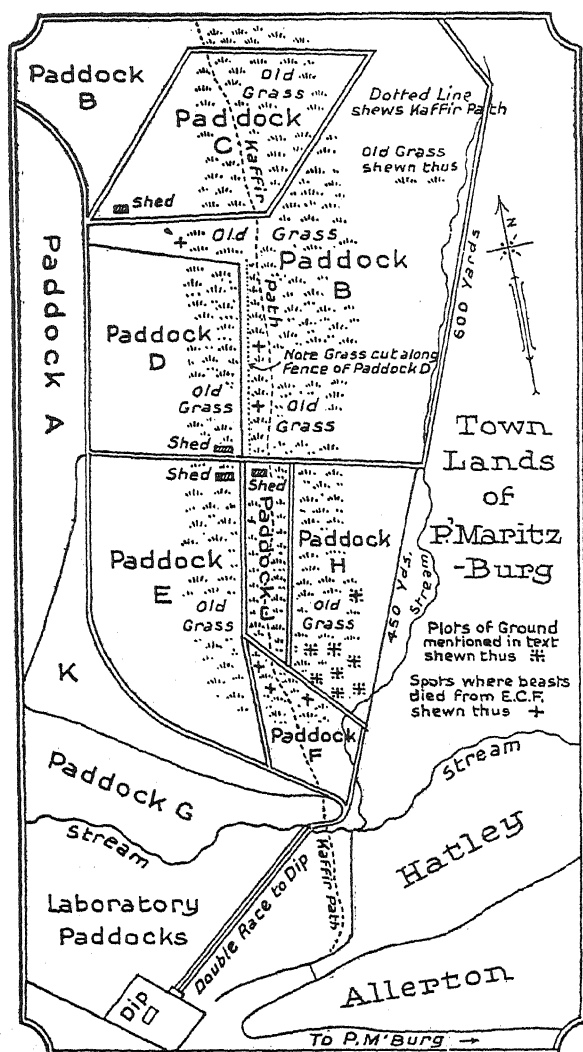
In hot weather it will be found that eight candles to the quart are necessary to produce a mixture of the required consistency, while during cold weather five or six candles will be found sufficient.

The above quantity will suffice for dressing the ears of from 120 to 150 animals, dependent upon temperature, manner of use, etc.

The mixture is best applied with a small swab tied to the end of a stick, and it will be found that no irritation attends even its repeated application to any external part.

It is not necessary to state that when preparing the above mixture over an open fire care should be taken by reason of its great inflammability.

SCHEDULE IX.



The accompanying map gives a general ground plan of the arrangement of the paddocks alluded to in the text of the report. The shaded portions in the centre of the map are in-

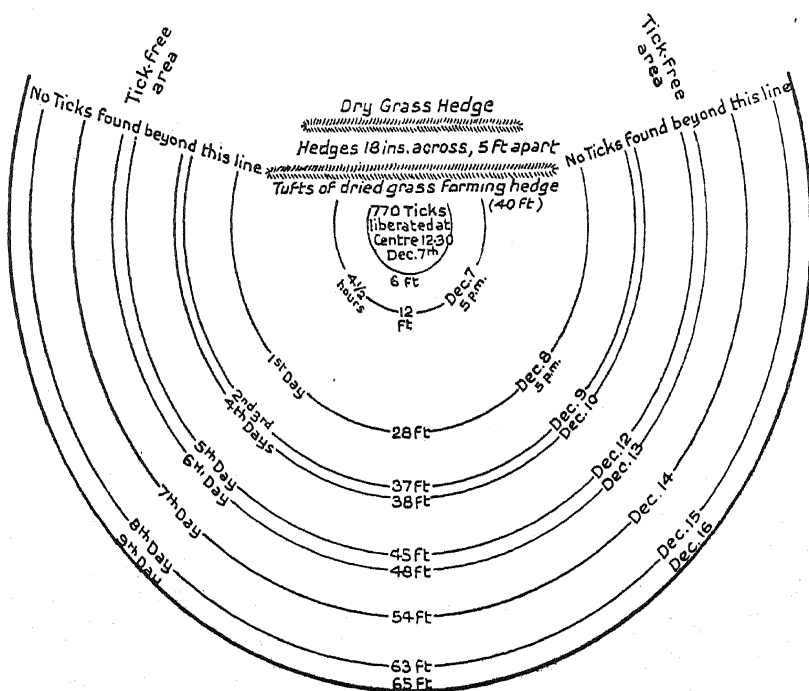
tended to denote areas of long (last year's) grass. In the laying out of the paddocks the inclusion of a portion of old grass was designed in order that experimental work contemplated should be conducted under conditions of the veld, such as obtain at different seasons.

Paddocks in which the disease was likely to become established were as a precautionary measure doubly fenced, where such paddocks abutted upon the town lands, with a safe interval or space between the fences. The watering of the cattle in certain of the paddocks was provided for by the placing of half-tubs just within the fence. These were filled by buckets from the outside, thereby avoiding any unnecessary entry of the paddocks themselves.

SCHEDULE X.

Tick Migration Experiment.

Second Observation



The above diagram is intended to show the rate and distance at which adult hungry ticks are able to travel.

The experiment was carried out on a piece of short, closely-trimmed grass upon which no ticks existed. The outer circle on the above diagram denotes the wall (composed of sheets of roofing iron joined end to end) of which the enclosure was constructed. This enclosure, originally only some fifty feet in diameter, was enlarged day by day as found necessary in order to keep pace with the extension of the ticks. Precaution was taken against risk of escape of ticks in crawling up this wall by tarring the top edge of the iron.

On 7th December, about mid-day, 770 active adult ticks were liberated at the centre of the 6-ft. circle. They appeared to disperse rapidly in all directions. After some hours the ground was closely observed, and the progress of the most advanced ticks marked by means of small sticks. Twenty-four hours later the ground was again closely searched, and the spots at which advancing ticks were discovered were again pegged out. In this way the progress made and the distance covered were recorded daily. As the longer distances were reached the search became more difficult, owing to the increased area of the circle, and the thinning out of the ticks. The ultimate point of sixty-five feet was not gained until nine days after liberation, only two of the more adventurous insects reaching this point. It is possible there may have been others which escaped detection, but this is not probable, as the daily search by a number of natives was long and close, in addition to which by far the greater number of the 770 ticks liberated were subsequently collected, so that no room for large margin of error exists.

Six feet behind the central point of the enclosure a line of turfs (each about 18 inches square, and cut from spots where old tall grass existed) was dug into the ground level with the surface of the surrounding grass. Packed closely, so as to secure normal density, these turfs form a miniature hedge, or belt, of old grass forty feet in length, while behind the hedge a second belt was placed at a distance of five feet, the grass between the rows being left undisturbed. Of the 770 ticks liberated, 453, or 59 per cent., were collected from the first hedge

three weeks later. Only nineteen had penetrated the grass, traversed the interval, and gained the further hedge, while beyond this second belt of grass no ticks could be found, though careful daily search was made.

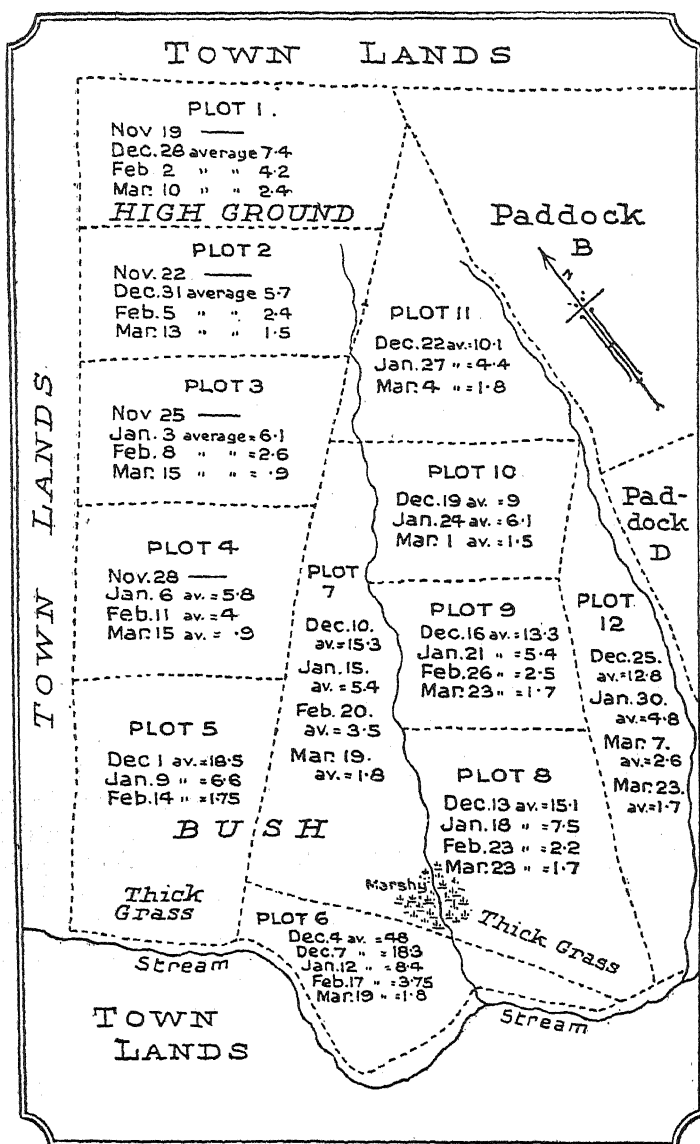
Within the centre or 6-ft. circle, where search was made three weeks later, 111 ticks were collected, which had not moved more than six feet from their point of liberation, forming an unprogressive minority of 14.4 per cent. of the total number, while 26.7 per cent. had travelled further afield.

Preliminary trials on a smaller scale had been made during the previous month, and as the results of the two experiments were in accord, observations were discontinued at the end of four weeks.

In reviewing the above findings, it may be objected that the conditions as regards the tick were artificial, and not such as obtain naturally.

The establishment, however, of some standard as to the rate and distance of tick travel may possibly be of great use in certain circumstances when attempting to estimate the probabilities and risks of infection of certain paddocks, fence lines, etc., while an accurate estimation of the risk of spread from any spot known to have been liable to infestation by mechanically transported ticks may prove of equal value. The utility of the belt of old grass as a defensive line needs, for the practical farmer, no comment.

SCHEDULE XI.



The above is a rough ground plan of paddock A, showing its sub-divisions. The top part of the map marked "high ground" is some 750 feet above the level of the spruit shown below. This fact will account for the difference between the numbers of ticks found, say, in plots 1 and 6. The sloping

sides of the two streams flowing south were covered with bush and scrub, while the low ground at the level near the main stream was in places marshy and covered with rank grass and reeds, which harboured large numbers of ticks.

Paddock A had been grazed over by cattle (which were regularly dipped) for some time prior to its sub-division for purposes of the above experiment, otherwise the number of ticks collected would have been considerably greater. An excessive number of ticks on a given area would not, however, appear to increase the trouble or time of clearing the same, provided a suitable proportion is maintained between the size of the ground and the numbers of beasts grazing the same.

SCHEDULE XII.

Relative Tick Activity during Day and Night.

18th February.—Two rabbits were placed in a paddock containing a large number of nymphs and larvae at 7.30 p.m., remaining until 11.30 p.m. (four hours). At that time they were examined, with the result that only a single larval tick was found attached

Control.

19th February.—Two rabbits were placed in the same enclosure from 8 a.m. to noon (four hours). On examination they were found to be infected with large numbers of nymphs and larvae.

The above experiment was repeated on 24th March, when the two rabbits, exposed from 7 p.m. to 11 p.m., were found to have picked up twelve nymphs in all—an average of six.

The two *controls*, liberated from 2 p.m. to 6 p.m., were found to have fifty-six nymphs attached—an average of twenty-eight—or over three and a half times the number picked up during the same length of time at night.

To *control* the above observations on rabbits, a calf was turned into the same paddock on 6th March from 7 p.m. to 11 p.m. On examination after the four hours' exposure, a single tick could be found attached.

Another calf, placed in the paddock from 11 a.m. to 3 p.m., was found to have picked up eighteen adult ticks and nine nymphs.

The above instances show the difference which exists in tick-activity between the hours of darkness and light. This difference seems difficult to account for inasmuch as no eyes exist in the tick, which cannot in consequence be dependent upon the sense of sight for selection or prehension of its host. Night and day, therefore—apart from the question of temperature—would presumably be indifferent to the tick when seeking attachment. Such, however, cannot be the case, as the foregoing instances show.

The difference between night and day may possibly be a matter of moment when determining, in any given case, the probability of infection having occurred or the general question of movement of stock.

Complete immunity cannot be looked for during the hours of darkness, but the risks of infection are obviously much lessened.

SCHEDULE XIII.

Residual Effect of "Three-Day" Dip in Horses and Cattle.

In order to determine what lethal effect immersion in the Three-day dip fluid exercised on adult ticks becoming attached shortly after the host had been dipped, a number of cattle were cleaned from ticks and then dipped. After three days the number of ticks dead and alive on these beasts were counted; since none of the ticks passed through the dipping tank the dead ticks found must have perished as the result of the saturation of the skin with arsenic at previous dipping or dippings, and to this reserve lethal power possessed by recently-dipped cattle the term residual effect has been applied. The average percentage of ticks thus killed in one hundred and seven (107) computations was found to be 16.8 per cent. in the case of cattle dipped in the "Three-day" dipping fluid.

In horses, two hundred and twenty computations were made in the same way as in the case of cattle, with the result that the average residual effect in this animal was found to be 22.5 per cent., while in certain cases this figure was considerably exceeded, as the following observation will show,

On 19th December four frequently dipped horses were cleaned of their ticks and dipped in "Three-day" dip. Four control horses were also cleaned but left undipped. These eight animals were then turned into a paddock moderately infested with ticks. After three days' grazing the four dipped horses were found to have attached to them twelve live ticks and seven dead ones, while the undipped horses had picked up thirty-two ticks, all of which were alive. Thus, out of nineteen ticks picked up by the dipped horses, seven, or 36.8 per cent., were killed as the result of the residual effect of the dipping given before their attachment.

It would seem also that a slight repellent effect was exercised in this case by the dip, inasmuch as the dipped horses picked up only about half the number of ticks found attached to the undipped animals.

It is probable, however—judging from the observations—a larger number of ticks than those actually found would have attached themselves to the dipped horses, and, becoming poisoned, would have loosed their hold before the estimation was made. In such a case the "residual effect" would be shown by even a higher figure than 36.8 per cent. as in the last test.

The 22.5 per cent. based on the 220 observations quoted above is therefore a low figure at which to estimate this "residual effect" in the horse.

It is not necessary to recall the fact brought out in Part II. of this Report published previously—that this increased destructive effect can only be looked for where frequent or short-interval dipping is adopted.

SCHEDULE XIV.

The Agency of the Tail Tuft in the Collection of Ticks.

First Observation, 1st December, 1910.

No. of Beast.	LONG TAILS.		No. of Beast.	SHORT TAILS.	
	In Brush.	At Root of Tail.		In Brush.	At Root of Tail.
42	0 Ticks	13 Ticks	68	0 Ticks	2 Ticks
49	4 "	20 "	77	1 "	19 "
65	5 "	19 "	81	0 "	7 "
66	17 "	21 "	83	0 "	11 "
67	24 "	7 "	85	0 "	14 "
75	4 "	7 "	86	0 "	16 "
76	9 "	17 "	87	0 "	18 "
78	8 "	9 "	88	0 "	21 "
79	4 "	11 "	89	1 "	14 "
80	15 "	18 "	90	0 "	20 "
82	4 "	11 "	92	2 "	14 "
84	1 "	19 "	93	0 "	12 "
91	3 "	34 "	94	7 "	14 "
95	19 "	8 "	96	0 "	9 "
100	6 "	9 "			
Totals ...	123 Ticks	223 Ticks	Totals ...	11 Ticks	191 Ticks

	Long Tails.	Short Tails.
Percentage in brush	35.5 %	5.4 %
Percentage under tail	64.5 %	94.6 %
Total number of ticks collected	346	202
Average per beast collected	23	14.4

The long tails collect 60 per cent. more ticks than the short tails.

Second Observation, 4th December, 1910.

No. of Beast.	LONG TAILS.		No. of Beast.	SHORT TAILS.	
	In Brush.	At Root of Tail.		In Brush.	At Root of Tail.
42	4 Ticks	17 Ticks	68	0 Ticks	36 Ticks
49	8 "	59 "	77	3 "	53 "
65	12 "	21 "	81	0 "	11 "
66	10 "	41 "	83	1 "	51 "
67	47 "	26 "	85	0 "	22 "
75	10 "	26 "	86	2 "	38 "
76	26 "	35 "	87	3 "	37 "
78	15 "	45 "	88	1 "	34 "
79	14 "	49 "	89	2 "	35 "
80	70 "	45 "	90	9 "	12 "
82	0 "	36 "	92	0 "	32 "
84	11 "	56 "	93	6 "	39 "
91	53 "	35 "	94	0 "	35 "
95	68 "	15 "	96	3 "	24 "
100	15 "	76 "			
Totals ...	363 Ticks	582 Ticks	Totals ...	30 Ticks	479 Ticks

	Long Tails.	Short Tails
Percentage in brush	38.4 %	5.9 %
Percentage under tail	61.6 %	94.1 %
Total number of ticks collected	945	509
Average per beast	63	36.3

The long tails collect 73.5 per cent. more than the short tails.

The above figures show the value of the tuft of the tail as an instrument for the collection of ticks. In the first observation the animals with a tail tuft (or long tail) were the means of collecting 60 per cent. more ticks than the beasts with cropped tails, while in the second observation the tuft was responsible for an excess of 73.5 per cent. over the stump tails. These figures are striking testimony to the agency of the long tail in the collection and destruction of as many ticks as possible. The comfortable delusion of clipping the tail and finding the number of ticks apparently decrease in consequence must in future be abandoned.

One disadvantage of the tuft should be noticed, and that is the tendency for ticks to collect in clumps at certain spots among the long hair, which latter furnishes a considerable protection from the process acting doubtless on the principle of the thatch. This difficulty, however, is easily overcome by the occasional use of a little of the dressing mixture described in Schedule VIII., which will retain its deterrent effect for some time.

SCHEDULE XV.

The Suitability of "Three-day" Dip in the Treatment of Scab in Sheep.

A flock of 160 sheep (merinos), carrying heavy fleeces, were allowed to become scabby, and the disease was permitted to run its course unchecked until it assumed an advanced and aggravated form. Half the sheep were then shorn and half retained their long wool.

On 5th December the whole flock was passed through the dip, the sheep swimming straight through and climbing out at the far end to drain. They were then turned out. Unfortunately, through an oversight, the flock was folded during the ensuing night in the old infected kraal, and there is no doubt re-infection became established to some extent in this way.

On 12th December half the flock (consisting of forty-five shorn and thirty-five unshorn) were again passed through the

tank in order to observe the effect of the repetition of the dipping at so short a period as seven days. No ill-effects were observed.

On 19th December the whole flock was again dipped, as, although the disease seemed checked, a few sheep continued to scratch and nibble.

On 28th December the whole flock was again dipped. Very little evidence of scratching or biting could be detected even after close watching, while scrapings from six of the apparently worst cases failed to show any evidence of live scab insects.

On 4th January the dipping was repeated, no signs of scratching or biting being observed and all scrapings being negative.

Since this time the flock has been passed through the dip every week for some sixteen to eighteen weeks in all. No accident has occurred nor has any sign of return of the disease been detected, while the flock has remained in excellent condition.

These results, which must be considered as satisfactory, proving both the possibility of the frequent immersion of sheep without danger and the ease with which an intractable disease such as scab, can be controlled without other than routine treatment. No hand-dressing or special treatment was resorted to, and the disease in the long-fleeced sheep became eradicated as rapidly as in the recently-shorn animals.

There is little doubt the eradication of the disease would have been even more rapidly effected had not the flock, after their first immersion, been folded for the night on grossly infected ground.

SCHEDULE XVI.

Effect of Weekly Dipping Process with Laboratory Dip upon Secretion of Milk.

The following figures, furnished by the courtesy of the manager of a large dairy establishment, are based upon the milk yield of about 125 cows over a period of six months.

Analysis of the figures will show that the average yield of milk upon the days of dipping was 1,375 lb. (based upon the morning milking prior to—and the evening ditto after—dipping).

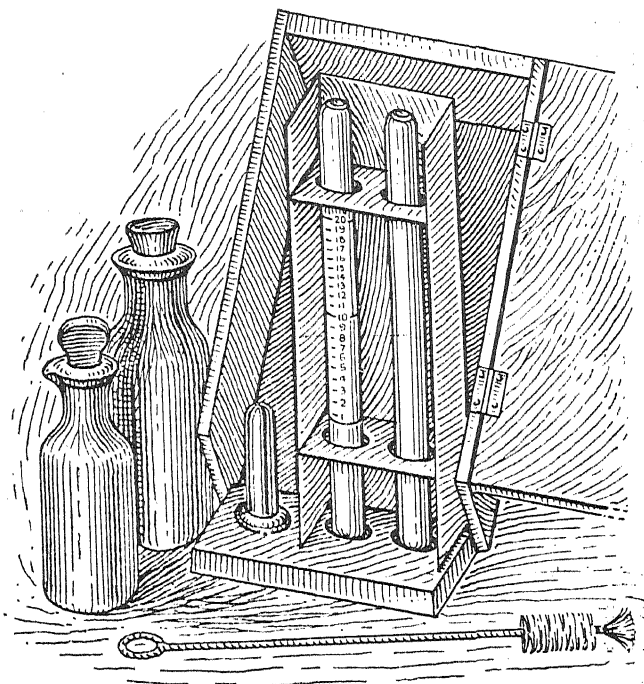
The average figure for the other six days—upon which no dipping took place—is 1,354 lb., or slightly less than the average for the actual dipping day.

These figures—based as they are upon adequate numbers over an extended period—answer the objections which are still frequently urged against dipping by reason of its effect upon the yield of milk.

SCHEDULE XVI.—(continued).
Effect of Weekly Dipping Process with Laboratory Dip upon Secretion of Milk.
 DAILY MILKING RECORD FOR A PERIOD OF SIX MONTHS.

Date, June.	Quantity of milk in lb.	Remarks.	Date, July.	Quantity of milk in lb.	Remarks.	Date, Aug.	Quantity of milk in lb.	Remarks.	Date, Sept.	Quantity of milk in lb.	Remarks.	Date, Oct.	Quantity of milk in lb.	Remarks.	Date, Nov.	Quantity of milk in lb.	Remarks.
1	1146	Av. 1158	1	1049	Dipped	1	1181	Av. 1245	1	1386	Av. 1381	1	1714	Dipped	1	1374	
2	1148		2	1067		2	1306		2	1365	Dipped	2	1678		2	1564	Av. 1581
3	1182	Dipped	3	999	Av. 1027	3	1370	Av. 1422	3	1334		3	1649	Av. 1636	3	1565	
4	1189		4	1071		4	1420		4	1225		4	1583		4	1616	Dipped
5	1184		5	1013		5	1478	Dipped	5	1346	Av. 1319	5	1632		5	1554	
6	1181	Av. 1103	6	1063		6	1511		6	1286		6	1648	Av. 1647	6	1537	
7	1174		7	1038	Av. 1042	7	1515		7	1286		7	1662		7	1565	Av. 1560
8	1169		8	1055		8	1602	Av. 1403	8	1258	Av. 1374	8	1681	Dipped	8	1580	
9	1117	Av. 1119	9	1037	Dipped	9	1302		9	1279		9	1626		9	1600	
10	1072		10	1000		10	1509		10	1175	Dipped	10	1546	Av. 1612	10	1471	Av. 1502
11	1080	Dipped	11	1036	Av. 1018	11	1550	Av. 1521	11	1246		11	1665		11	1536	
12	1063		12	1040		12	1504		12	1348	Av. 1292	12	1594	Av. 1665	12	1504	Dipped
13	1134	Av. 1119	13	1043	Dipped	13	1402		13	1283		13	1590		13	1488	
14	1160		14	1017	Av. 1106	14	1382		14	1324		14	1702	Dipped	14	1543	Av. 1531
15	1126		15	1017		15	1444	Av. 1146	15	1407	Av. 1377	15	1702		15	1564	
16	1036	Av. 1089	16	1222	Dipped	16	1413		16	1401		16	1709	Av. 1650	16	1519	
17	1057		17	1218		17	1407		17	1426	Dipped	17	1393		17	1532	Av. 1462
18	1100	Dipped	18	1232	Av. 1226	18	1482	Av. 1403	18	1340		18	1690	Av. 1510	18	1635	Dipped
19	1097		19	1232		19	1426		19	1490	Av. 1434	19	1554		19	1590	
20	1090	Av. 1049	20	1211	Av. 1182	20	1478	Dipped	20	1442		20	1550		20	1560	Av. 1540
21	1081		21	1165		21	1408		21	1462	Av. 1462	21	1427	Dipped	21	1563	
22	1008		22	1172		22	1335	Av. 1369	22	1503		22	1613		22	1539	
23	1034	Av. 1044	23	1178	Dipped	23	1346		23	1362		23	1538		23	1533	
24	1092		24	1155		24	1480		24	1398	Dipped	24	1546	Av. 1516	24	1581	Av. 1478
25	1025	Dipped	25	1179	Av. 1194	25	1480	Av. 1404	25	1496		25	1524		25	1522	
26	995		26	1248		26	1483		26	1477	Av. 1516	26	1504		26	1515	Dipped
27	965	Av. 971	27	1310		27	1320	Dipped	27	1555		27	1509	Av. 1465	27	1424	
28	1014		28	1278	Av. 1274	28	1312		28	1455		28	1534		28	1549	Av. 1486
29	1090		29	1234		29	1326		29	1579	Av. 1549	29	1570	Dipped	29	1487	
30	1033	Av. 1027	30	1256	Dipped	30	1374	Av. 1437	30	1615		30	1400		30	1540	
31			31	1248		31	1393		31			31	1537	Av. 1437			

SCHEDULE XVII.

The "Isometer."

The apparatus delineated above is one devised by Dr. Watkins-Pitchford and named by him the "Isometer." It is used for the estimation of the exact percentages of arsenic present in any sample of dipping fluid. Two tubes, one of which is graduated, are held in a metal frame attached to one end of the containing wooden case. This frame serves as a stand for the testing apparatus, which is blackened to prevent reflection of light through the fluids.

The right-hand tube is filled with the dip fluid to be tested. The method of testing is briefly as follows:—The left-hand tube is filled by the colouring testing fluid as far as the first mark on the tube. The dip in the right-hand plain tube is then poured cautiously into the second or graduated tube, where it mixes with the testing fluid. As the mark numbered ten is approached in this latter tube the colour of the fluid gradually

changes, and when the mark is finally reached the tints of the two tubes are exactly alike. When, however, the dip to be tested is stronger than the standard "Laboratory Dip," the identity of colour of the two tubes is reached before the fluid reaches to the mark 10. Conversely, when the dip is weak the column of fluid is not matched in colour until it reaches above this mark. The point at which colour correspondence between the two tubes takes place is noted on the graduated glass scale of the tube, and the number of this graduation is found upon reference to an accompanying table to give the exact amount of arsenite of soda or of water, which is necessary to bring the dip to the standard strength.

Correspondence.

It is intended to set aside a section of this Journal for correspondence on all subjects affecting the farming industry of Southern Rhodesia and it is hoped that farmers will avail themselves of this opportunity of expressing their views. Suggestions for practical consideration and discussion, and hints as to improved methods, applicable to any branch of agriculture will be particularly welcome. Questions and enquiries upon agricultural topics of general interest, or concerning any of the articles published from time to time, in the Journal are invited. In all cases replies will be posted as soon as possible, and where of general interest particulars will be published. All correspondence must be addressed to the Editor of the AGRICULTURAL JOURNAL, Department of Agriculture, Salisbury.

Notes from the Agricultural Laboratories.

BOTANICAL.

A MARKET FOR CHICORY ROOT.—The crop of chicory grown at the Botanical Experiment Station, Salisbury, in 1911, on unmanured ground, gave an average yield of two tons of dried root per acre. The roots were cut in slices about an inch thick and were dried on boards in the sun. A two hundred pound sample of root prepared in this manner was forwarded to Mr. H. Marples, of the Natal Steam Confectionery Works, Prince Edward Street, Durban, by whom it was purchased at the rate of £17 per ton landed in Durban. Reporting on the sample, Mr. Marples writes as follows: "The samples are first-rate and of the same quality I could take this year anything up to twenty-five tons. The cutting of your root is rather too fine and I have mailed you a small sample showing a size that will not take so much labour as you have evidently expended on yours." The samples of dried root sent by Mr. Marples are about $\frac{3}{4}$ to 1 inch in thickness and when sliced in the green stage would have been about 2 inches in thickness.

We would remind farmers that the railage on dried chicory root from Salisbury to Durban (*vide* Farmers' bulletin No. 88, Chicory Growing) are :—

For fifteen ton lots or over	...	£5 2s. 8½d. per ton.
In five ton lots but under fifteen tons		£6 1s. 2½d. „

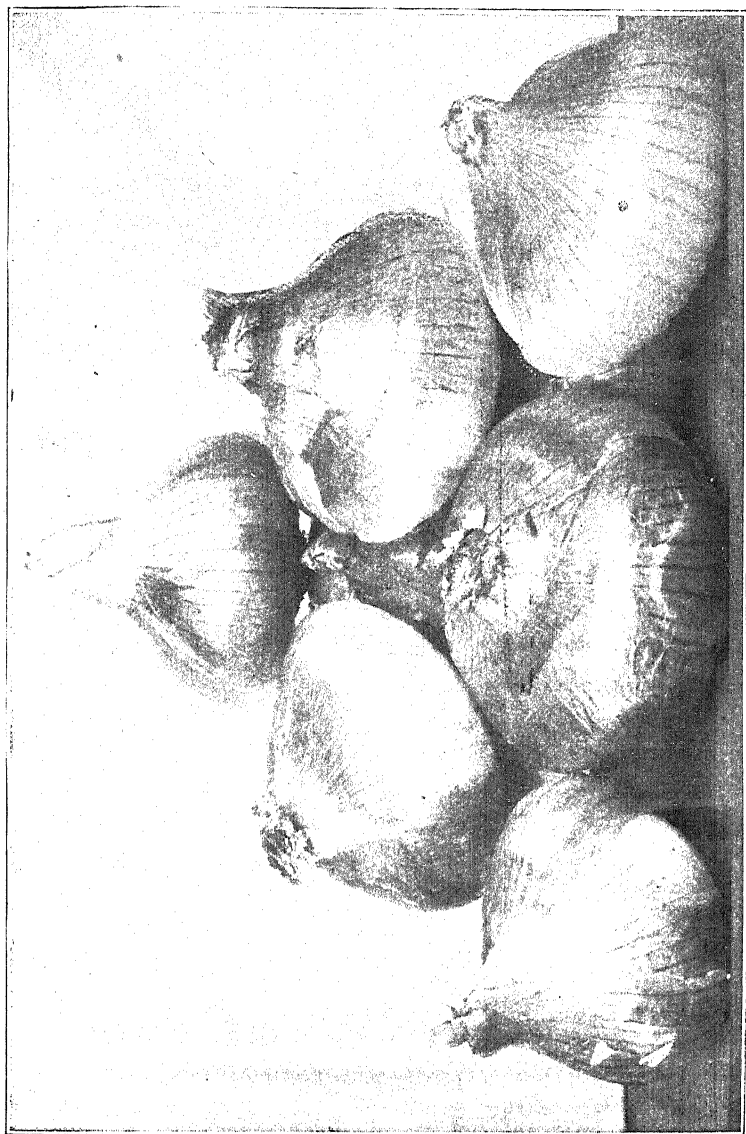
Since the handling and preparing of chicory entails a good deal of labour, it is hardly likely that any one farmer would produce a sufficient quantity to obtain the rate on fifteen ton lots except by combination with neighbours. There is no reason why this should not be done. A crop of two tons of dried root per acre, selling in Durban at £17 per ton, less railage £5 2s. 8½d. per ton, will leave a gross profit per acre of approximately £23.

ONIONS ON DAMP LAND WITHOUT IRRIGATION.—We are indebted to Mr. R. Richards, of Woodlands farm, Headlands, for the following information regarding an experiment in onion growing on damp granite soil without irrigation. The sample of onions submitted for examination is illustrated herewith. The weight of the ten bulbs was $7\frac{1}{2}$ lbs., the largest weighing 13 ounces, with a circumference of $13\frac{3}{4}$ inches, and the next $12\frac{1}{2}$ ounces, circumference $13\frac{1}{2}$ inches. Reporting on his experiment, Mr. Richards states that the seed beds were sown on April 5th, and the bulbs transplanted on May 25th. The land was well manured with dung and Safco fertiliser, and the variety grown was the Natal Red. The yield was at the rate of eight tons per acre and the quality of the onions left nothing to be desired.

In confirmation of these results it is interesting to quote from the report of a farmer in the Insiza district, whose letter dated December 20th, 1911, reads as follows:—"Last winter I raised from an experimental plot of half an acre of wet vlel land, 80 bags of onions free from thrip."

CALABASH PIPES.—From information recently received it would appear that a market for good class calabash pipes still exists. The Acting Union Trades Commissioner, London, writing under date, *October 14th, 1910*, made the following statement:—"The Trade say the sale of calabash bowls in this country is done and smokers are going back to their briar-pipes; the only demand is for very good bowls for the Canadian and American markets and these must be A.I. quality." Similarly the Secretary of the South African National Union wrote on *December 12th, 1910*, "Messrs. Liberman & Buirski state that they are not buying calabash pipes now and they understand that the same attitude is taken up by other Capetown buyers since the market in Europe is heavily overstocked and the demand they understand, due to the fact that the article is to a great extent out of fashion, is very low."

On the strength of this advice several correspondents were warned that the demand for calabash bowls was very limited and offered but little inducement to the grower. As has been



Natal Red Onions, grown by R. Richards, Woodlands Farm, Headlands, in damp soil without irrigation

said, however, the market appears lately to have slightly improved and Mr. J. Hodgson Hartley, 312 Mutual of New York Buildings, St. George's Street, Capetown, writes under date of *15th December, 1911*, as follows:—"I had a letter this mail which shows the English market to be very slow and unreliable for the coming season. I may probably be buying up to a hundred thousand calabash bowls, but apparently the outlook is somewhat flat for next season after the boom of the present season. I shall be very glad to have samples from any of your farmers, with a view to expressing an opinion as to size, colour, quality, etc., which may be of some service."

The price quoted is 9d. each for bowls of first grade and 6d. each for second grades and any farmers interested in the crop or having supplies for disposal will do well to communicate with Mr. Hartley.

H. G. M.

CHEMICAL.

DESTRUCTION OF CROWS.—As many farmers suffer considerably from the depredations of crows during the planting season, the following method of exterminating the pest, which has been used with great success in New Zealand, is published for general information.

"Twelve pounds of maize are thoroughly damped with fresh milk so that the whole grain is wet but not dripping with moisture, one ounce of powdered Strychnine (not too fine) is then gradually shaken on the grain, the whole being kept constantly stirred. When all the poison is mixed in, the grain should immediately be scattered thinly over the ground."

The method has the advantages that the grain, if efficiently mixed, presents no perceptible abnormality in colour, taste, or smell, and granivorous birds eat it readily.

Mr. F. Gillwald, of Lonekop, Headlands, recently tried the method and reports upon the result as follows: "The remedy has been entirely successful, there is not a crow to be seen and I had hundreds of them on the farm! I carried out the instructions to the letter, excepting that I only started with

half quantities (*i.e.* six pounds of mealies and half ounce Strychnine), and I am glad I did so, for I found that the bait laying had to be repeated; of course, the Strychnine does not become incorporated with the mealies, and although we had no rain during the trial, after a day and a night or two out on the land the bait seemed to have lost its efficiency. I repeated the dose twice (six pounds of mealies and half ounce Strychnine each time.)"

Mr. Gillwald further points out that "the crow is an early riser and that on that account the bait should be put on the land about sunrise, so that the dew (or rain) can not possibly have any effect upon it."

Since crows devour a large number of cutworms, etc., at the time the land is being prepared for cropping, they should not be interfered with until the actual planting season begins.

CAUTION.—Strychnine being of an intensely poisonous nature, none but picked men should be employed for the work. One ounce equals $437\frac{1}{2}$ grains, and one grain of Strychnine is regarded as the average fatal dose for an adult human being.

G. N. B.

ENTOMOLOGICAL.

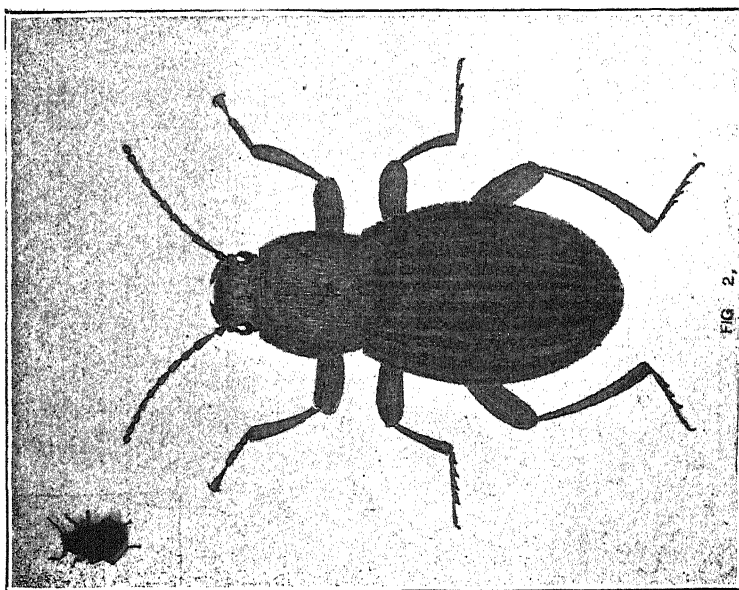
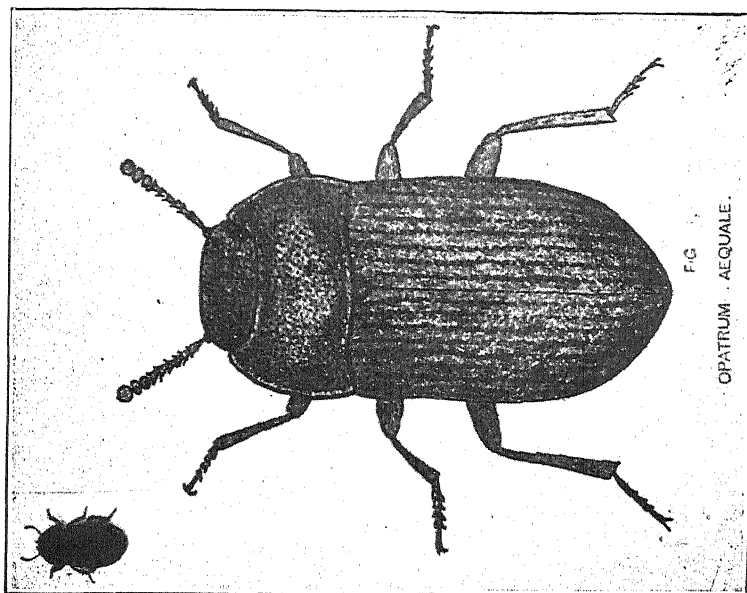
TWO DESTRUCTIVE BEETLES.—It is a common thing in walking over newly planted maize land near Salisbury to notice a certain quantity of the seeds lying on the surface of the ground with the heart wholly or in part eaten out. This damage is usually put down to birds or field mice and no further notice is taken of it. During the present season, however, with its abnormally dry Spring, the damage has been more severe than usual, and has caused the manager of a farm near Salisbury to call the attention of this office to the loss being sustained, the damage being assigned to the work of a small blue beetle living in the ground. This beetle is in the office collection determined by Dr. Peringuey of the South African Museum, Capetown, as *Emyon tristis*. Fabr. and is shewn at Figure 2 in the adjoining plate. The

colour of this species is blue black. In cloudy weather *E. tristis* can be seen in numbers eating the maize grains on the newly planted lands. The writer visited the scene and found two other species of beetle abundant in the soil, and brought back numerous species of all three with a view to ascertaining the damage, if any, done by each. One species proved quite harmless, refusing to touch the maize seed offered in its cage, but both *E. tristis* and the species, determined by Dr. Peringuey as *Opatrum aequale*, and figured at Figure I in the plate, devoured the heart of the grain in the manner seen in the field. *O. aequale* is a flatter beetle than the other, shuns the light more and is more nocturnal in its feeding habits. The colour is really black, but as it is generally seen, it is the colour of the ground, owing to the adherence of particles of the soil to its back, due to the presence of innumerable minute strongly-curved hairs or bristles, doubtless developed for this purpose. The work of the two species was so exactly alike that the grains injured by each could not be distinguished. Some of the injured grains are shewn in the plate. The germ of the grain is in most cases eaten first, but sometimes the starchy portion suffers first. This probably happens when this portion is first exposed by the hungry beetles. In the cage tests it was found that *O. aequale* is far more energetic than *E. tristis* in digging up the grains, in fact the latter species for several days failed to find the grains buried in the soil in the cage, and finally only one grain was unearthed out of six. *O. aequale* on the other hand dug up several of the grains the first night. In the field it is likely that the bulk of the grains are unearthed by this species, *E. tristis* coming to the feast when the grain is brought to the surface. Between them, the two species destroyed between 40 per cent. to 50 per cent. of the grain planted on the farm visited, and information of injury nearly as severe was received from other farms near Salisbury. It is to be noted that the damage done by these beetles is in direct proportion to the length of time that the grain lies in the ground before germinating. Grain planted in wet ground hardly suffers at all, but if it lie a week or more without germinating, the loss due to this cause is serious. It should be mentioned that these beetles are present in various numbers in all the red land near Salisbury that the writer has examined, and that often their numbers are enorm-

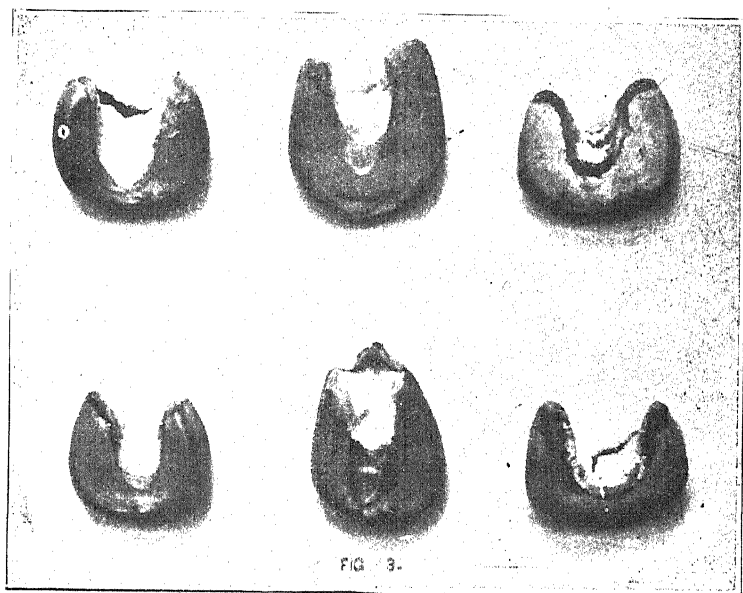
ous. They may be found by turning over a clod, pulling up a weed or looking under a heap of rubbish. Both species belong to the *Tenebrionidae*, the members of which are not usually harmful, with the exception of a few species that live in stored meal and grain. The species under consideration, however, will not only eat the dry grain as described, but even eat green vegetable tissue, a habit which is at least very unusual for any member of this family in the adult stage. *O. æquale* is again more energetic in this respect. A whole lettuce leaf introduced into the cage with several dozen of the species was totally devoured in the night, the beetles commencing to eat it as soon as it was introduced. Next night a few *sweet-potato* leaves shared the same fate, and later a *tobacco* leaf was completely eaten. The specimens of *E. tristis* ate holes in the leaves introduced into their cage, but although in considerably greater numbers than *O. æquale* none of the leaves were more than half eaten.

There is reason to believe that *O. æquale* is injurious to newly planted-out *tobacco* plants, doing injury that is probably often put down to cutworms. On certain tobacco lands, the writer found a number of newly planted plants lying on the ground, partially or wholly severed. On searching for the apparent cutworm in each case nothing could be found except dozens of *O. æquale* gathered round the stem. The avidity with which this beetle devours tobacco leaves in the cages, renders it highly probable that they were the cause of the injury, although the known habits of this family caused a little doubt at first. It is to be noted that these beetles are not true leaf eaters, and that their feet are not constructed for clinging to the smooth surface of an aerial leaf. The damage they do is on the ground level, and is directed against the stems of the plants or prostrate leaves.

Fortunately it has been found that the poisoned bait used for cutworms attracts and kills both these species of beetles very readily. For the idea of using this poison for these pests the writer is indebted to Mr. T. H. Newmarch, of "Thornpark," near Salisbury. In January of last year, Mr. Newmarch baited a piece of ground for cutworms, and took



Laboratory Notes—Entomological. (Two destructive beetles).



Injured Maize Grains.

the trouble to send to this office specimens of all the dead insects he could find. The greater number of these were *E. tristis*, but *O. æquale* was also present. In the present outbreak therefore, it was decided to try poisoned bait. In the cages it was found that both species readily ate the sweet film off "Vaalbosch" leaves dipped in sugar solution and arsenic, and died. The manager of the infected farm was then advised to try the remedy, using:—

Arsenite of Soda	...	...	1lb.
Treacle ...	...	...	8lbs.
Water ...	...	...	10 gallons.

A quantity of grass was chopped up, wetted with the above, and distributed about the infested lands. The writer visited the farm a few days later and found the treatment extremely successful. The two species of beetles were lying dead in enormous numbers about the field, and more dead bodies were to be found under clods and heaps of rubbish. In the earlier treated parts of the land hardly a live beetle was to be found, but in a later treated portion where the poison had been used in a more dilute form, living beetles were numerous. It is necessary therefore to use the poison at full strength.

The value of poisoned bait applied to maize and tobacco lands before planting, cannot be too strongly emphasized. It will destroy the *beetles* that may take a heavy toll of the grain if the ground remains fairly dry for a week or more, or injure the planted tobacco, and it will destroy the *cutworms* that may take a further toll of the young plants. It is a good insurance for the crop.

Market Reports.

SALISBURY.

In Salisbury the market continues to be very firm. Mealies dropped slightly at the end of January, but are firm again at 20/- to 21/-. There is a distinct shortage, which is likely to be maintained until the new crop comes in. Potatoes are very scarce and supplies are now being obtained from the Cape. The local stock of onions is exhausted and fresh supplies will have to be imported from the Cape. There are good stocks of oats and oat forage, and good supplies are also held by the farmers. Beans, monkey nuts and kafir grain cannot be obtained locally, and Southern farmers cannot supply. In fact all over South Africa there is a serious shortage of these commodities.

BULAWAYO.

Wholesale grain merchants have little to report. Grain is coming in more freely but a hardening tendency is expected, onions are a trifle dearer, and monkey nuts are slightly higher in price. Potatoes which were fetching 35/- a week ago, have dropped to 26/-, and supplies are coming in from the Cape fairly freely. Hay is selling at enhanced prices. Live stock dealers report that there have been several enquiries for heifers recently. Good quality is required and buyers stipulate for animals coming from redwater veld. The demand for mules and donkeys has slackened considerably, and the business on the whole is quiet. Vegetables are very scarce and the produce coming forward is of poor quality. Fruit is coming in freely and prices are better.

JOHANNESBURG.

At Johannesburg the demand for maize is keen, with an advancing tendency for fair to good grain. Kafir corn continues firm for clean parcels, and oat hay is more plentiful, without, however, affecting values, and the enquiry is active. Barley is quiet and only the best samples are in

demand. The arrivals of beans and peas are insignificant and prices are firm. Hay is arriving slowly and there is a brisk enquiry. Potatoes are firmer, deliverances having been comparatively small during the week. Fruits show no improvement in values, and only the choicest are selling at remunerative prices.

KIMBERLEY.

Bran, easier; chaff, price lower; oat hay, price lower; oats, firm; kafir corn, firm; mealies, price advancing; wheaten meal, easier; potatoes, fluctuating, good samples realise well; onions, cheap.

ENGLAND.

Messrs. Fear, Colebrook & Co., Ltd., report that the Home market continues firm for all grain, and wheat and oats are both dearer. Values are about as follows:—Yellow round maize, 29/- to 29/6 per 480 lbs. c.i.f.; South African maize, 29/- to 29/9 per 480 lbs. c.i.f., or 11/- to 11/4½ per bag free on board; River Plate oats, for early shipment, 16/6 to 17/- per 304 lbs. c.i.f. to the United Kingdom, or equal to 7/0½ to 7/3½ per bag free on board your side; South African oats would be worth about 7/3½ per bag, free on board; red wheats, 34/- to 37/6; white wheats, 36/- to 37/- per 480 lbs. c.i.f.

Messrs. Fear, Colebrook & Co., Ltd., Southampton; Messrs. Jas. Lawrence & Co., Ltd., Kimberley and Johannesburg; Messrs. Wightman & Co., Ltd., and Messrs. Whitfield & Co., of Salisbury have kindly supplied prices.

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Barley, per 150 lbs. ...	10/0 12/9	9/0 12/6	—	30/0 32/6
Beans, per 203 lbs. ...	20/0 25/0	—	—	—
Beans, Sugar ...	—	24/6 32/0	32/6 35/0	—
Beans, kafir, per 203 lbs. ...	—	20/0 24/0	32/6 35/0	25/0 27/6
Boer Meal, unsifted, per 200 lbs. ...	15/0 20/0	22/6 24/0	42/0 43/0	42/6 45/0
Boer Meal, sifted, per 200 lbs. ...	—	—	—	—
Bran, per 100 lbs. ...	6/0 6/6	5/6 5/9	10/6 12/0	15/6 16/6
Flour ...	—	—	25/0 26/6	—

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Flour, Colonial 100 lbs.	—	13/0 14/6	22/0 22/6	20/0 24/0
Forage, T'vaal, 100 lbs.	3/0 4/3	4/0 4/3	10/0 12/6	—
„ Colonial „	—	—	—	—
„ Oat „	4/6 4/9	—	10/6 12/0	—
Hay, per bale ...	6/0 8/0	—	75/0 80/0 (ton)	9/0 10/0
Kafir Corn, White, per 200 lbs. ...	14/0 14/6	14/6 17/6	16/0 17/0	11/0 11/6
Manna, per 100 lbs. ...	1/6 2/0	—	—	—
Mealies, S.A., White per 200 lbs. ...	10/6 11/0	12/6 13/6	19/0 19/6	20/0 21/0
Mealies, S.A., Yellow, per 200 lbs. ...	10/0 12/6	12/6 13/0	17/6 18/6	—
Mealie Meal, White, per 200 lbs. ...	—	12/6 13/0	—	19/0 20/0
Manga, per 200 lbs. ...	—	—	—	—
Monkey Nuts, per bag	—	—	18/0 19/0	—
Oats, per 150 lbs. ...	7/6 10/0	10/6	20/0 21/6	22/0 24/6
Onions, per 120 lbs. ...	4/0 8/0	6/0 8/6	17/6 18/6	21/0 23/0
Peas, per 200 lbs. ...	18/0 19/6	—	—	—
Potatoes, per 150 lbs. ...	3/6 7/6	10/6	19/6 28/0	27/6 30/0
„ New „	10/6 15/0	14/0 18/0	—	—
Rapoko „	—	—	—	22/0 24/6
Rye, per 200 lbs. ...	10/0 13/6	—	—	—
Salt, per 200 lbs. ...	—	3/0 4/0	10/6 11/6	15/0 16/0
Tobacco, good, per lb	2d. 7d.	4d. 7d.	—	—
„ inferior, per lb	—	1d. 2d.	—	—
Wheat, per bag 203 lbs.	14/0 16/3	18/6 19/6	—	25/0 27/6
Butter, per lb. ...	1/0 1/2	10d. 1/1	1/6	2/0
Butter, second quality	—	—	—	—
Eggs, per doz. ...	1/8 2/0	8d. 1/3	2/0 3/3	3/6 4/0
Ducks, each ...	2/0 3/6	2/6 2/9	3/0 3/6	4/0
Fowls, each ...	2/0 3/9	1/0 2/6	1/9 3/0	3/6
Geese, each ...	4/0 4/10	—	—	12/6
Turkeys, each ...	8/6 17/6	5/0 10/0	12/0 25/0	17/6 £1

LIVESTOCK.

Horses ...	£12 £25	£10 £25	£25 £40	£25 £30
Mules ...	£12 £25	£18 £25	£31 £37/10	£20 £25
Donkeys, geldings	£6 £8	£5 £7	£7/0 £8/10	£6 £7
„ mares	—	£6 £7/10	£8/10 £10/10	£9
Cows, Dairy	—	—	£25 £35	£25
Cows, Native	—	—	£7/10 £9/10	£8/15 £9/10
Oxen, Trained	—	£8/10	£8/10 £11/10	£10
Cows, Slaughter	£7 £15	£7 £8/5	—	£8 to £9/10
Oxen, Ordinary	—	—	—	—
Oxen, good	—	—	—	—
Oxen, medium	—	—	—	—
Calves, ...	—	—	—	—
Heifers, Colonial	—	—	—	—
Heifers, Native	—	—	—	—
Sheep, ...	8/0 18/0	13/0 15/0	18/6 22/6	17/6
Lambs, 30 lbs.	—	—	—	—
Hamels ...	—	—	—	—
Pigs, clean, per lb.	2½d. 4½d.	3d. 3½d.	3d. 4d.	4d. 4½d.

Agricultural Reports

DECEMBER, 1911.

The unusually dry and hot weather of November was prolonged in most districts far into December, and when the belated rains broke they were partial and localised so that whilst some farms and districts have been favoured, elsewhere there was a serious deficiency. This state of affairs was true over the whole territory more or less, so that whilst it is incorrect to speak of any prospect of famine yet there will be an irregularity in our next crop, and as a whole a harvest much below last year's, with correspondingly higher prices. For some time past there has been a deficiency of food supplies in the country and there is some difficulty in tiding over the period of shortage before the next crop is available, particularly in the native districts of Chibi and Chilimanzi, Ndanga and Makoni. Elsewhere there is still plenty of beer-making going on, a sign that the shortage of native grain cannot yet be severely felt. The rains came too late for planting mabele that had failed at the first sowing, but this is being replaced to a considerable extent, especially in Matabeleland, by maize. Owing to crude methods of cultivation, native crops are likely to suffer more than those of Europeans, but even these are as a general rule considerably diminished by the unfavourable season, whilst the ultimate prospects depend very much on the occurrence of early frosts which may be fatal to the many late sown crops.

The spring potato crops have suffered much whilst tobacco planters have experienced the annoyance of seeing bed after bed of seedlings grow beyond the planting-out stage, although, latterly the weather proved more favourable, and a considerable extent, probably much more than last

year, has been planted out to this crop which is now completely established in the country and rapidly extending in public favour. There is a growing tendency to grow other crops than maize, even in summer and the total acreages of potatoes, monkey-nuts, beans, manna, wheat, oats, onions, linseed, and so on, is now quite considerable. These crops are no longer problematic and only require to be better known to be more generally sown.

There are general indications of an improvement in the supply of native labour due to several causes, planting time being past, and scarcity of food in some localities.

Everywhere the rain had been enough to bring on the veld and all classes of stock are doing well everywhere, cattle, especially, are thriving.

A number of developed farms are changing hands, new comers being apparently willing to pay for improvements, and the original holders prepared to realise their profits and strike out to pastures new further afield. Prices of land rule high, though they are somewhat arbitrary as no recognised standard exists beyond what the buyer is willing to give.

The sale, by public auction, of the 1911 Rhodesia tobacco crop, took place at the Grading Warehouses, in Salisbury, on January 31st, and February 1st and 2nd. Buyers representing eight firms were present and spirited competition resulted. The auctioneer was Mr. W. H. Williamson, of Messrs. Whitfield & Co. The tobacco was graded and prepared for sale under the supervision of Mr. Rice, manager of the warehouse. The crop offered for sale constituted a record and amounted to 453,495 lbs. All, with the exception of 46,093 lbs. of Turkish leaf, was of the Virginian type. The average price paid for Virginian leaf, exclusive of "scrap," was 1s. 2³/₄d. per lb., and for Turkish 2s. 1¹/₂d. per lb. The "scrap," it is estimated, fetched an average price of 3¹/₂d. per lb. The marked advance which has been made in the industry is reflected in the figures for the two previous years. In 1909, at the first tobacco sale held, 100,000 lbs. of leaf were sold, the total amount realising, £5,833. In 1910, 135,000 lbs. of tobacco

were sold at the auction for a total sum of £7,395, while this year, more than four times the amount was realised, the actual figure being £30,101 1s. 11½d. The highest sum paid for Virginian Leaf was 3s. 7d., which amount was paid for a parcel weighing nearly 900 pounds, grown by Messrs. Henderson and Walker, of Marandellas. This is the highest price ever paid in Rhodesia for Virginian leaf. Of the Turkish tobacco, a bale of about 50 lbs. weight was sold at 4s. 4d. a pound, and this also is a record for this type.

The chief purchasers of the crop were: The United Tobacco Company, £11,073; The Rhodesia Tobacco Company, £5,929; Messrs. Policansky (Cape Town), £3,580; Messrs. Herman & Canard (Cape Town), £3,161; Mr. G. M. Odlum (Salisbury), £2,253; Mr. Truter (Kimberley), £1,399; Mr. Kaplan & Co., (Port Elizabeth), £273; Mr. Kaufman (Salisbury), £122; and Mr. Seelig (Salisbury), £63.

Messrs. J. & R. McChlery sent in the largest quantity of Virginian leaf for sale while the great bulk of the Turkish leaf was grown by the Inyoka (Rhodesia) Tobacco Company, Sebungwe.

Veterinary Report November and December, 1911.

BULAWAYO.

AFRICAN COAST FEVER.—Existing outbreaks:—

Bembesi, Nduba Farm ... Two Deaths.

Bulawayo Commonage ... Four Deaths.

Fresh Outbreak:—In November a fresh outbreak occurred on a fenced portion of the Essexvale Estate, known as the North Paddock. The number of cattle involved was 73, of which 26 died or were destroyed as infected. Arrangements are being made for the disposal of the remainder by slaughter and removal to clean veld.

INYANGA, MAKONI AND MELSETTER.

No further cases have occurred and there are no cattle now on the infected veld.

SALISBURY.

At the temperature camp on the farm Gillingham a calf showed a rise of temperature. Examination of spleen smears showed Kock's bodies on one occasion. The animal recovered without showing any marked symptoms of illness. A similar case occurred in March last year.

UMTALI.

On the 11th December a six week's old black calf one of a herd of 29 belonging to Mrs. C. Eickoff, Umtali Commonage, appeared sick. Gland smears were sent to the Government Veterinary Bacteriologist who reported that the smears showed bodies which were identical with Kock's bodies. The calf died on the 15th, the post mortem examination

showing lesions of African Coast Fever. The remainder of the herd were immediately moved to clean veld and temperatures taken twice a day.

No further cases of sickness have occurred.

DEATHS REPORTED DURING MONTH.—Franklin, Umtali Commonage, dun cow, suspected cause of death, heart disease. Black and white cow, cause of death peritonitis. Barry & English, Umtali Commonage, black and white bull calf, cause of death, traumatic peritonitis. Van Riet, Thabancha, 2 year old ox. In each case smears were sent to the Government Veterinary Bacteriologist, Salisbury, the result being negative.

HORSE SICKNESS INOCULATION.—15 mules were inoculated during the month. There were two deaths, one occurring on the 12th day and one on the 14th day. The symptoms shown were those of Dunpaarde variety of horsesickness. Three mules reacted, two severely and one slightly. These also showed symptoms of Dunpaarde.

IMPORTATIONS.—47 head of slaughter cattle were imported from Portuguese territory.

KIMBERLEY REEFS.

One case of horsesickness.

NYAMANDHLOVU.

One mule died of horsesickness.

MAZOE.

Two outbreaks of scab.

RABIES.—Cases have occurred in Victoria, Mrewas, Insiza and Gwelo districts where the regulations have been put in force.

J. M. SINCLAIR,
Chief Veterinary Surgeon.

Salisbury,
31st January, 1912.

Weather Bureau.

TEMPERATURES.

STATION.	NOVEMBER.		DECEMBER.	
	Max.	Min.	Max.	Min.
MASHONALAND—				
Chicongas Location	87.2	57.5	91.8	65.3
Chishawasha	84.6	55.9	85.6	60.6
Hallingbury Farm (Hartley)	88.5	58.9	89.3	63.2
Hartley Gaol	89.0	58.9	87.8	62.0
Mount Selinda	76.5	59.0	82.7	62.4
Salisbury Laboratory	82.7	56.9	83.5	60.5
„ Gaol	84.0	57.7	84.2	61.4
Shamva Mine	87.2	63.2	—	—
Sinoia	—	—	93.0	59.0
“Summer Field” (Umtali)	87.8	56.4	89.3	60.7
Victoria	84.9	60.3	57.2	64.4
Victoria Falls	94.0	65.4	94.6	66.7
York Farm (Inyanga)	78.6	52.2	77.6	53.3
MATABELELAND—				
Bulawayo (Observatory)	85.0	60.2	87.8	63.3
Empandeni	84.0	60.8	92.4	64.6
Gwelo Gaol	84.6	58.0	87.3	61.3
Plumtree	84.9	59.4	—	—
Rhodes Matopo Park	84.6	59.9	88.7	62.4
Tuli	88.2	63.0	99.4	66.3

RAINFALL.

STATION.	Nov.	Dec.
MASHONALAND—		
Ardgowan (Hartley)	1.71	4.85
Banket Junction	2.38	0.97
Charter (Meikle's Farm)	—	1.08
Charter (Range)	1.87	3.74
Chicongas Location	1.18	5.16
Chilimanzi	1.94	—
Chishawasha	1.36	2.34
Darwendale	1.50	3.92
Darwin	0.82	4.95
Driefontein (Umvuma)	1.72	3.46
“Eagle's Nest” (Makwiro)	2.36	3.57
Eldorado (Railway Station)	—	—
Enkeldoorn	2.46	2.30
Gadzema (Giant Mine)	3.06	6.81
Gatooma	—	4.61

RAINFALL—continued.

STATION.	Nov.	Dec.
MASHONALAND—(Continued)		
Gatooma (Railway Station)	—	4'45
Goromonzi	—	—
"Grootfontein" (Umvuma)	1'51	2'90
Gunyananya	3'22	5'74
Gutu	1'22	4'56
"Hallingbury" (Hartley)	2'46	6'57
Hartley, Railway Station	3'46	6'94
" Gaol	3'41	9'39
Helvetia (Melsetter)	4'33	4'75
Inyanga (York Farm)	1'91	5'44
Inyanga (Police Camp)	1'92	1'66
Kanyamba	0'70	1'90
Lone Cow Estate (Lomagundi)	1'82	4'42
Lowdale	0'91	2'11
Macheke (Railway Station)	2'62	1'65
Makwiro	2'34	7'18
Marah Ranche	4'51	3'97
Marandellas (Railway Station)	2'40	2'77
Marandellas (Land Settlement Farm)	3'17	0'82
Marandellas (Good Hope)	5'09	3'57
Marthadale (Victoria)	1'50	—
Mazoe	3'01	3'64
"Meadows" (Salisbury District)	1'50	3'79
Melsetter	1'42	—
Monte Cassino (Makoni District)	—	1'86
Morgenster	2'01	4'98
Mrewa	1'52	3'78
M'toko	Nil	5'27
Mount Silinda	4'00	5'13
Pamushama	1'30	4'00
Premier Estate	2'88	2'30
Police Station	—	0'81
Rusapi Railway Station	3'42	0'90
Salisbury	1'02	2'40
Gaol	0'79	2'62
Laboratory	0'68	—
Public Gardens	0'86	3'38
Railway Station	—	0'34
Rhodesville	1'06	2'93
Shamva	—	3'86
Sinoia	—	—
Slenish (Mazoe District)	—	—
"Stoneygate" (Hartley District)	3'90	7'88
"Summerville" (Umtali District)	1'7	—
Sunnyside (Mazoe)	0'84	2'09
Teigu	1'05	3'26
"Tom's Hope" (N. Melsetter)	3'67	6'63
"Tweedjan" (Marandellas)	4'26	0'82
Umtali	—	0'98
Umtali Railway Station	1'03	2'25
Umtali (Mutambara Mission)	—	2'43
Umvuma Railway Station	—	2'68
"Utopia," Umtali District	1'50	2'61
"Vermont," Melsetter District	1'71	3'72
Victoria	4'44	7'76

RAINFALL—*continued.*

STATION.					Nov.	Dec.
MATABELELAND—						
Balla Balla	...	...	...	...	1'14	1'53
Battlefields Railway Station	...	...	...	...	3'37	—
Bembezi (Railway Station)	...	...	...	...	1'25	3'65
Bulawayo	...	...	{ Government House		1'32	4'70
			{ Observatory		2'00	6'22
			{ Raylton		1'84	4'16
Empandeni	...	...	...	...	1'30	1'67
Fig Tree	...	...	...	...	1'95	2'19
Filabusi	...	...	...	...	1'37	3'60
Globe and Phoenix	...	...	...	...	0'49	1'20
Gwaai Railway Station	...	...	...	...	0'60	5'58
Gwanda Railway Station	...	...	...	...	1'40	2'79
Gwelo	...	...	...	...	0'94	1'88
Gwelo	...	...	{ Railway Station		0'73	1'82
			{ Lower		1'59	4'23
Heaney Railway Station	...	...	...	...	2'47	4'38
Imbeza Kraal	...	...	...	...	0'73	6'60
Insiza Railway Station	...	...	...	...	1'60	4'51
Inyati	...	...	...	...	1'89	5'82
Malindi	...	...	...	...	1'52	2'88
Mangwe Pass	...	...	...	...	2'74	0'93
Marula	...	...	...	...	1'36	3'76
Matopo Mission	...	...	...	...	0'36	1'37
Matopo Park	...	...	...	...	2'89	3'73
Maxim Hill	...	...	...	...	2'92	6'01
Mazunga	...	...	...	...	0'47	3'31
Melinakanda Junction	...	...	...	...	1'04	3'62
Mtshabzi Mission	...	...	...	...	1'20	2'21
Nyamandhlovu	...	...	...	...	0'97	5'37
Plumtree	...	...	...	...	3'73	—
Que Que	...	...	...	...	0'79	1'47
Rhodesdale Estate	...	...	...	...	2'37	3'78
Rixon	...	...	...	...	2'46	2'50
Selukwe (Railway Station)	...	...	...	...	2'04	6'60
"Shawlands" (Gwelo)	...	...	...	...	0'79	2'86
Solusi	...	...	...	...	0'91	4'63
Syringa	...	...	...	...	0'74	—
Tegwani	...	...	...	...	2'07	3'29
Tuli	...	...	...	...	1'11	2'77
Umgusa (Bubi)	...	...	...	...	0'66	—
Victoria Falls	...	...	{ Railway Station		1'10	4'28
			{ Police Camp		0'65	3'28
			{ Hospital...		1'81	4'45
Wankie	...	...	{ Railway Station		1'00	5'27
West Nicholson Railway Station	...	...	...	...	0'57	1'25

Dates of Meetings of Farmers' Associations, Southern Rhodesia. (SUBJECT TO ALTERATION).

Name of Association.	Place of Meeting.	Secretary.	1912.											
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
*Central	Umvuma and Enkel- doorn	R. Aldons	27	24	30	27	25	29	27	31	28	26	30	28
Chipinga	Chipinga	L. Dobell	25	25	25	25	25	25	25	25	25	31	26	31
Enterprise	Artcurus	Jas. Watson	30	27	26	30	28	25	30	27	24	29	9	26
Figure Branch, R.L. & F.A.	Figure Siding	A. Curtis	...	10	10	...	11	11	10	10	10	12	9	14
Gatooma	Gatooma	Lionel Gobell	13	10	9	13	11	8	13	10	14	12	9	14
Gazaland	Lower Melsetter	H. F. Savory	4	10	9	4	11	8	6	10	7	5	9	7
Hartley	Hartley	H. Barnes Pope	...	...	...	...	...	...	...	...	...	...	...	...
Headlands	Headlands	W. B. Harris	...	...	...	...	...	...	...	...	...	...	...	...
Insiza	Insiza Station and Peggy Store.	G. P. Watermeyer	...	...	10	14	12	9	14	11	8	13	10	8
Kimberley Reefs	Kimberley Reefs	P. W. Kidwell	...	...	...	...	...	...	...	...	...	...	...	...
Lomagundi	Sinoia	G. F. Kidson	...	...	...	...	...	...	...	...	...	...	...	...
Macheke	Macheke	G. F. R. McLellan	...	...	...	...	...	...	...	...	...	...	...	...
Makwiro and Norton	Makwiro	P. B. Snashall	6	3	2	6	4	1	6	3	2	7	4	2
Manica	Xmas Pas Hotel	C. M. Wright	16	3	2	9	14	1	6	3	17	5	2	7
Marandellas	Marandellas & Settle- ment Farm.	MacW. Ingram	...	...	...	...	...	...	...	...	...	...	...	...
Marula	Marula Siding	W. H. Williamson	6	3	2	6	4	2	6	3	7	5	2	7
Mashonaland	Salisbury	W. E. Dowsett	...	...	3	...	...	...	...	...	1	...	...	1
Matopo Branch, R.L. & F.A.	Matopos Terminus Hotel.	M. W. Fynn	20	17	16	20	18	15	20	17	21	19	16	21
Mamba Branch, R.L. & F.A.	Mamba Siding	N. N. Rutherford	...	...	2	...	...	...	...	...	7	...	...	7
Mazoe	Mazoe	M. L. Price	13	10	9	13	11	8	13	10	14	12	9	14
Melsetter (North)	Various Farm Houses	A. Tulloch	...	...	7	4	2	6	4	1	5	3	7	13
Midlands	Gwelo	Chas. Atkinson	4	1	1	4	14	14	9	9	11	11	29	7
Northern Umali	Farm "Jerain"	Harry Hopkins	26	23	29	26	31	28	26	30	27	25	29	27
Plumtree	Plumtree	S. Annandale	...	...	2	6	4	1	6	3	7	5	2	7
Rhod. Landowners & Farmers	Bulawayo	N. N. Rutherford	...	...	...	...	...	...	...	...	...	...	...	...
Sonabula and Shangani Flats	Farm "Fairview"	W. Krienke	...	...	...	...	...	...	...	...	...	...	...	...
Umvumunya	T'Membarra Mission	J. Rutherford	...	...	...	...	...	...	...	...	...	...	...	...
Upper N'gezi	Upper M'gezi	F. A. Readman	17	21	20	17	15	19	17	21	18	16	20	18
Victoria	Victoria	...	...	...	...	...	...	...	...	...	...	...	...	...
Victoria (Eastern)	Good Hope Farm	...	...	...	...	...	...	...	...	...	...	...	...	...

* Meeting held at Enkeldoorn.

* Head Quarters at Umvuma. One Meeting in each quarter held at Enkeldoorn.

† Meeting held at Settlement Farm.

Garden Calendar.

MARCH AND APRIL.

By N. L. KAYE-EDDIE.

FLOWER GARDEN.

During these months the garden should be seen at its perfection and, owing to our rains, requires a great deal of attention in order to keep the soil free from weeds and caking. Drainage should also be looked to in order to avoid plants being swamped or washed away. Dahlias and carnation should now be in their heaviest bloom and will require tying up and the dying blooms should be removed in order to prolong their flowering period. Plants for winter flowering should be now coming on and planted out.

Cuttings of carnations may now be made and should be picked from the choicest plants and taken from stems which have borne the finest blooms. The cuttings should be placed in boxes containing sand and kept in a moist condition in a warm position sheltered from the winds. These should be ready for planting out in about two months and bloom in three. Carnations, verbena, antirrhinum, penstemon, pansy, dianthus, phlox, calliopsis and escholtzia may be sown for early blooming next spring.

VEGETABLE GARDEN.

Tomatoes, peas and beans should be in full bearing, and should be staked and tied. Weeding and cultivation should be extensively carried out. Seeds for late winter crops—beans, cabbage, cauliflower, peas, radish, turnips, spinach, beet and radish should be sown.

Departmental Notices.

LECTURES FOR FARMERS.

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable, lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner but the suggestion of other themes is invited.

Agriculture.—Maize growing; Maize selection and maintenance of the breeding plot; Points of maize and maize judging, with demonstrations; Utilisation of granite vlei soils; Ground nut culture; Rotation crops for home use and for sale; Veld improvement by winter grasses; Production of foodstuffs for the mines; Ensilage; Fungoid diseases of maize and wheat; Wheat, oats, and lucerne under irrigation; The prospects of cotton culture in Southern Rhodesia.

Veterinary Hygiene.—Detection and prevention of disease
The care of livestock.

Livestock.—Judging of cattle according to breeds, and for beef, milk, and draught; feeding and kraaling of live stock; hints on the principle of cattle breeding.

Chemistry.—The principles of soil fertility; the principles of manuring; the value of lime in agriculture; chemistry of milk and its products (accompanied by demonstrations in milk testing).

Entomology.—Economic entomology on the farm; the role of insects and their allies in the transmission of disease; scale insects and fruit trees and methods for their control; insect pests and maize; enemies of the potato, insect and fungus; the value and objects of plant import and nursery regulations.

Irrigation.—Methods of applying water to land for irrigation ; the measurement of water in connection with irrigation ; canal irrigation ; storage reservoirs ; hints on the selection of sites and on the design of earthen and other dams ; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, soils, crops, processes and kindred matters, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without any indication of where they are from, or why they were sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding speci-

mens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particular regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

CO-OPERATIVE EXPERIMENTS.

DISTRIBUTION OF WINTER CEREALS.

The undermentioned winter cereal seeds will be available for distribution, free on rail Salisbury, under the usual terms of co-operative experiments, during the months of February to May, 1912.

Not more than four or five kinds can be issued to each applicant, and the weight of seed of each will be from 15 to 20lbs. The successful results which have been obtained with winter cereals when sown on naturally moist land without irrigation, justify the hope that any of those below mentioned are likely to prove satisfactory, and all are worth trial under such conditions, as also under irrigation where this is available.

Those marked with an asterisk have been found specially suited to non-irrigated land, and where birds are troublesome bearded wheats are preferable to beardless varieties. Quick maturing varieties are most suitable for land which dries out

early in the season, or for late planting. The most suitable amount of seed to sow per acre, has not yet been definitely determined but on most soils about 40—45lbs of wheat and rye and 60 to 70lbs of oats or barley usually appear satisfactory.

WHEAT.

*Early Gluyas,	beardless,	very early.
*Bobs,	„	mid. season.
*Golden Ball	„	„
*Zwart Baard	bearded	late
Medeah	„	„

OATS.

- *Sidonian, mid. season
- Texas
- Gray Side Oat
- *Algerian, requiring about seven months
- *New Zealand, late, a feed oat too coarse for forage

BARLEY,

- *Nepal barley wheat
- Chevalier malting barley

RYE.

- *Early Rye
- *Mammoth Late Rye—Slow maturing, under favourable conditions and if sown early can be fed off in mid. winter and allowed to run into ear in early spring.

Farmers receiving seeds under terms of co-operative experiments are reminded that they are under an obligation to report on the result of the experiments, as soon as the crop is reaped.

Applications should be addressed to the Agriculturist and Botanist, Department of Agriculture, Salisbury, and should be accompanied by full particulars as to the method of forwarding which is desired. In the case of consignments to be sent by Parcel Post or addressed to a siding, on which charges must be prepaid, the applicant should enclose cheque or post office order to defray expenses.

LOANS FOR FENCING.

The Government is prepared to assist by financial loans farmers desirous of erecting internal or boundary fences. Enquiries should, in the first instance, be directed to the Director of Agriculture.

THE VETERINARY STAFF.

The following particulars regarding the Veterinary Officers stationed at various centres is published for general information, to enable farmers to apply to the proper quarter for their services, permits, etc.

SALISBURY DISTRICT.

Description of Area.—Includes the following areas for the movement of working cattle: Nos. 32 to 58 (excluding No. 48, Headlands, in the Umtali District).—G.N. 12 of 1912.

Acting District Veterinary Surgeon	...	R. Williams.
Assistant Veterinary Surgeon	...	R. Gunn.

Cattle Inspectors in Charge of Areas.

H. G. Norris	...	Salisbury	...	Hunyani Tank, 1,645½-mile peg, B. & M. & R. Rys.; Salisbury A, B, C and D; and Junction M. & L. Ry.
J. Cameron	...	Lomagundi	...	Gwebi Tank Halt; Banket, Lomagundi; Eldorado, Lomagundi; and 35-mile peg, L. Ry.
K. Dingwall	...	Kimberley R'fs	...	Kimberley Reefs area.
T. H. Tilly	...	Marandellas	...	Marandellas North & South.
H. R. Kelly	...	Macheke	...	Macheke Station.
W. E. J. Hunt	...	Hartley	...	Gadzema Station; Makwiro Station; Norton Siding; and part Hartley and Gatooma.
J. F. Windram	...	Gatooma	...	Part of Hartley & Gatooma; and Battlefields Station.
A. P. L. Cazalet	...	Salisbury	...	I/c Dipping Tanks, Salis- bury Commonage.
E. A. Nesbitt	...	„	...	I/c Letombo Camp and general duty.

J. J. Kayser	... Mazoe	... 23-mile peg, Lomagundi Ry.; Passaford Station; Selby Siding and Mazoe.
N.C.	... Goromonzi	... Arcturus and Bromley.

BULAWAYO DISTRICT.

Description of area.

That part of Matabeleland, west of the Que Que area, and including the following area for working cattle: Nos. 1 to 11, 14 to 23, and 59 to 61, G.N. 12 of 1912, also the land between, that has not been declared in any area for working cattle.

Assistant Chief Veterinary Surgeon, C. R. Edmonds.
 District Veterinary Surgeon, G. C. Hooper Sharpe.
 Assistant Veterinary Surgeons: G. Pinchin, A. Crapp,
 B. A. Myhill, J. B. Idle,
 Clerk, T. G. Derry.

Cattle Inspectors in charge of areas.

S. H. Malan	... Bulawayo	... Heany Junction, Redbank.
P. H. Krige	... „	... I/c. malleination stable; dipping tanks, Bulawayo commonage.
—	... Gwanda	... Sabiwa Siding, Gwanda Station and West Nicholson,
G. Honey	... Plumtree	... Plumtree and Marula Siding
J. Paxton	... Nyamandhlovu	Nyamandhlovu Station and Malindi.
W. Johnson	... Insiza	... Insiza, North and South, and Shangani, North and South.
H. N. Evans	... Belingwe	... Belingwe.
H. Mitchell	... Inyati	... Bembesi Station.
A. Giese	... Wankies	... Wankies & Matetsi Siding.

Cattle Inspectors in charge of dipping tanks.

H. N. Coventry,	Mzingwani infected area.
R. S. Pain,	World's View.
J. Parks,	Bulawayo.

GWELO DISTRICT.

Description of area.

Includes the following areas for the movement of working cattle: Nos. 12 and 13 and from 24 to 31. G.N. 12 of 1912, and land within not open for the movement of working cattle.

Acting District Veterinary Surgeon: J. D. Ferguson, Gwelo.
Assistant Veterinary Surgeon: E. Middleton, Victoria.

Cattle Inspectors in charge of areas.

J. Cameron	... Gwelo	... Somabula Siding, Gwelo Station, Hunter's Road Siding, and Que Que Station.
P. Curran	... Selukwe	... Selukwe and Surprise.
G. W. Cameron	Umvuma	... Indiva Siding, Lalapanzi, and also issues permits for Iron Hill Siding and Umvuma.
K. A. Leahy	... Victoria	... Iron Mine, Hill Siding.
G. W. Cumming	Enkeldoorn	... Umvuma Siding.

UMTALI DISTRICT.

Description of area.

Includes the native districts of Umtali, Melsetter, Makoni and Inyanga.

Acting District Vet. Surgeon: D. R. Chatterley, Umtali.
Assistant Veterinary Surgeons: J. White, Rusapi.
R. Archibald, Umtali.

Cattle Inspectors.

W. E. Harvey,	Umtali.
J. B. Fisher,	"
L. Mitchell,	Inyanga.
G. Ledeboer,	Rusapi, Headlands area.
J. McKenzie,	Inyanga.
J. C. Mather,	Penhalonga.
J. Whittie,	Melsetter.
J. Donohoe,	South Melsetter.

PURCHASE OF STUD BULLS FOR DISTRIBUTION TO FARMERS.

It is the intention to purchase in England bulls and heifers for importation to Southern Rhodesia, for inoculation and re-sale at actual cost, on the undermentioned terms, to approved applicants in occupation of farms.

The animals will be of the Shorthorn, Hereford and Sussex breeds. The probable limits of price in England will vary from twenty to forty guineas, to which will be added freight, cost of inoculation and maintenance, and incidental charges.

The following are the classes offered :—

Bulls—10 to 15 months, 15 to 18 months and 18 to 21 months.

Heifers—15 to 21 months (all approximate ages).

Delivery is expected to take place during the month of October, 1912.

Applications will be considered in order of priority of registration, and choice of animals allowed from the class applied for in the same sequence, up to a date to be fixed, after which selection shall be open to all remaining applicants. Due notice will be given of the date delivery is to be effected.

All applications should be addressed to the Director of Agriculture, Salisbury, and must be accompanied by a deposit of £5, which will be forfeited in case of withdrawal, refunded should no animal be supplied, or deducted from the ultimate price of animals delivered to purchasers, as the case may be. Applications should clearly state the breed and class of cattle desired, as indicated above, and in the case of heifers the number required, and signify agreement to the subjoined terms of purchase. In no case will more than one bull be supplied to any one applicant, but the number of heifers is not limited. No animal is to be disposed of until payment is completed, without the written consent of the Director of Agriculture. Until finally paid for, the purchaser will be required to provide such accommodation, food and attention as may be laid down in the purchase agreement.

TERMS.

Payment comprises £5 deposit on application, a sum of £30 on delivery to applicant, and the remainder in two equal instalments six and twelve months thereafter. Every animal shall, on delivery, be insured at the joint expense of the purchaser and the British South Africa Company. In the event of death, when the Company receives payment from the insurance company, the purchaser will be absolved from all liability.

These proposals are subject to the removal of the present embargo on cattle from Great Britain owing to the recent outbreak of foot and mouth disease there.

The right of refusal of any application, without stating the reason, is reserved. Applications should be made promptly to the Director of Agriculture.

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEONS' SERVICES ARE AVAILABLE TO THE PUBLIC.

1. On and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge, for the following purposes only:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lungsickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3 sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases :—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz. :—

	£	s.	d.
(1) For every professional visit within three miles of his office or residence ...	0	5	0
(2) For every professional visit beyond such distance plus an additional charge of 2/6 per hour whilst engaged in such visits or £2/2/0 a day of 24 hours ;	0	10	6
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees :—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each ...	1	1	0
c. " " bulls " ...	0	5	0
d. " " donkeys " ...	0	10	6
e. For parturition cases, mares, each	2	2	0
f. " " " cows " ...	1	1	0
g. For other operations, according to nature, from 5/- to £2/2/0.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously

ill. It is rarely possible to comply with these requests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

DESTRUCTION OF WILD CARNIVORA, ETC.

It is hereby notified for public information that rewards for the destruction of wild carnivora, etc., will be paid on the scale and conditions herein set forth.

2. Rewards will be paid as follows :—

For each lion ...	...	...	£5	0	0
For each leopard ...	...	...	1	0	0
For each cheetah ...	...	...	1	0	0
For each hyæna ...	...	...	0	10	0
For each wild dog ..	...	...	0	10	0
For each baboon ...	...	...	0	2	6
For each crocodile not less than 3 feet in length ...	...	...	0	10	0
For each crocodile over 1 and less than 3 feet in length ...	...	...	0	2	0
For each crocodile under 1 foot in length...	...	...	0	0	6
For each crocodile egg ...	...	...	0	0	6

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, of the district, within three months of the date upon which the animal is killed, on a solemn declaration on the prescribed form hereunto annexed.

4. In proof of destruction, applicants for rewards will be required to produce and surrender in the case of a leopard or cheetah the skin with the tail unsevered, and in the case of a hyæna, crocodile, wild dog or baboon the unskinned head. In the case of a lion to produce the skin and skull, the skull only to be surrendered.

5. The skins and heads surrendered for rewards shall become the property of the Government and shall be disposed of in such manner as may be decided on.

FORM OF DECLARATION.

I,.....do solemnly and sincerely declare that I did on the.....day of, and not before, shoot, trap, or poison (as the case may be)..... (describe the vermin for which the reward is claimed) in the district of.....within the boundaries of Southern Rhodesia, and that I am entitled to the reward offered by the Government,

And I make this solemn declaration conscientiously believing the same to be true.

.....
Signature.

Signed and declared at.....
this..... day of.....

Before me,

.....
Magistrate or Justice of the Peace.

CHEMICAL ANALYSIS OF AGRICULTURAL PRODUCTS.

Arrangements have been made for the chemical examination of soils, limestones; grain, and other produce; oil-seeds, cream, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

SERVICES OF AGRICULTURAL ENGINEER.

It is hereby notified for public information that the services of Mr. W. M. Watt, Agricultural Engineer, are available to the public for the following purposes. Assistance may be obtained by farmers:—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

DIPPING TANKS.—GRANTS IN AID.

The Government is prepared to assist farmers in the construction of private dipping tanks by a grant in aid on the £ for £ principle, but not to exceed, however, a total sum of £50.

This grant will only be paid to approved applicants, and after the tank has been inspected by an official appointed for this purpose and found suitable, and on production of receipted accounts in support of their claim.

Applications cannot be considered for grants in aid of tanks already constructed, and those wishing to avail themselves of this assistance should apply beforehand to the Director of Agriculture, from whom full particulars, together with plans and specifications, can be obtained.

SERVICES OF TOBACCO EXPERT.

Farmers wishing to avail themselves of the services of the above should apply to the Director of Agriculture, giving particulars of the nature of advice required, also the distance and direction of their farms from some well-known centre.

DEPARTMENTAL BULLETINS.

The following Bulletins, consisting of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia :—

AGRICULTURE.

- No. 2 The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., L.L.B.
- „ 35 The Conservation of Kraal Manure, by H. Godfrey Mundy, F.L.S.
- „ 81 Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S.
- „ 61 Requirements in sending Botanical Specimens to the Department for Identification.
- „ 56 The Use of Lime in Agriculture, by G. N. Blackshaw, B.Sc., F.C.S.
- „ 59 Plans and Specifications of Flue Curing Barns.
- „ 71 Report of Forestry in Southern Rhodesia, by J. Sims, F.H.A.S.
- „ 78 Hints on Irrigation—Small Gravitation Schemes—Pipes and Pipe Laying—by W. Martin Watt, Government Agricultural Engineer.
- „ 68 Fertility of Soils and Organic Matter, by G. N. Blackshaw, B.Sc., F.C.S., Government Agricultural Chemist.
- „ 64 Hints on Irrigation—Small Earthen Reservoir—by W. M. Watt.
- „ 79 Winter Cereals, by H. Godfrey Mundy, F.L.S.
- „ 99 Bean Crops, by H. Godfrey Mundy, F.L.S.

CROPS.

- No. 55 How Maize can be made more profitable, by H. Godfrey Mundy, F.L.S.
 „ 85 Use of Maize as Forage, by R. H. B. Dickson.
 „ 76 Suggestions for Cotton Growers, by R. H. B. Dickson.
 „ 23 The Ground-nut or Pea-nut, by H. Godfrey Mundy, F.L.S.
 „ 92 Manuring of Tobacco on Mr. L. Black's Farm, G. N. Blackshaw, B.Sc., F.C.S.
 „ 57 Onion Growing, by H. Godfrey Mundy, F.L.S.
 „ 48 Possible Rotation of Crops for Southern Rhodesia, by H. Godfrey Mundy, F.L.S.
 „ 67 Maize Breeding and Seed Selection, by H. G. Mundy, F.L.S., Government Agriculturist and Botanist.
 „ 88 Chicory Growing, by H. Godfrey Mundy, F.L.S.
 „ 93 Soy Beans, by R. H. B. Dickson.
 „ 106 Cultivation and Preparation of Ginger.
 „ 107 The Cowpea, by R. H. B. Dickson.

ENTOMOLOGY AND VEGETABLE PATHOLOGY.

- „ 58 Onion Thrips, by R. W. Jack, F.E.S.
 „ 12 The Tsetse Fly, by L. E. W. Bevan, M.R.C.V.S.
 „ 39 The Relationship of Ticks and Disease, by R. W. Jack, F.E.S.
 „ 46 The Head Smut of Maize, by H. Godfrey Mundy, F.L.S.
 „ 89 Insect Friends of the Farmer, by R. W. Jack, F.E.S.
 „ 41 Root Gall Worm in Potatoes, by Rupert W. Jack, F.E.S.
 „ 42 Black Orange Aphis, by Rupert W. Jack, F.E.S.
 „ 44 Maize Stalk Borer or Mealie Grub, by Rupert W. Jack, F.E.S.
 „ 52 Regulations affecting the Importation of Potatoes, by Rupert W. Jack, F.E.S.
 „ 66 Selection of Spraying Outfit, by R. W. Jack, F.E.S.
 „ 69 Resin Wash and Means of Applying It, by R. W. Jack, F.E.S.
 „ 75 Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by R. W. Jack, F.E.S.
 „ 100 Tsetse—Preliminary Notes on the Habits of—by R. W. Jack, F.E.S.

VETERINARY.

- „ 14 Bots in Equines, by R. Ferguson Stirling, M.R.C.V.S.
 „ 34 Accidents to Cows after Calving, by J. M. Sinclair, M.R.C.V.S.
 „ 54 African Coast Fever, by L. E. W. Bevan, M.R.C.V.S. (revised edition)

- No. 49 Notes on Bovine Plasmoses of Southern Rhodesia, with special reference to Mashonaland, by L. E. W. Bevan, M.R.C.V.S.
- „ 51 Strangles, by F. D. Ferguson, M.R.C.V.S.
- „ 50 Epizootic Abortion in Cattle, by L. E. W. Bevan, M.R.C.V.S.
- „ 102 The Construction of Dipping Tanks for Cattle.
- „ 103 Dipping and Tick-Destroying Agents, by Lt.-Col. H. Watkins-Pitchford.
- „ 53 Animals Diseases Consolidation Ordinance, 1904.
- „ 82 Difficult Parturition of the Cow, by C. R. Edmonds, M.R.C.V.S.
- „ 91 Common Ailments of the Horse, by D. R. Chatterley, M.R.C.V.S.
- „ 80 Detection and Prevention of Diseases of Stock, by L. E. W. Bevan, M.R.C.V.S.
- „ 86 African Coast Fever—Transport Cattle, by L. E. W. Bevan, M.R.C.V.S.
- „ 84 African Coast Fever—Diagnosis of Gland Puncture, by L. E. W. Bevan, M.R.C.V.S.
- „ 36 Notes on Trypanosomes of the Dimorphon Group, by L. E. W. Bevan, M.R.C.V.S. and M. E. MacGregor.
- „ 95 Oestrus-ovis in Sheep, by Alec King
- „ 20 Wireworm or Hairworm in the Melsetter District, by E. M. Jarvis, M.R.C.V.S.

MISCELLANEOUS.

Terms for Analysis by the Department of Agriculture, of Produce, Soils, Water, etc.

- „ 83 Hints on Brickmaking, by G. S. Dyke.
- „ Loans for Fencing.
- „ 37 Rural Education in Rhodesia, by G. Duthie, M.A., F.R.S.E.
- „ 63 Game Law : Summary of.
- „ 62 Services of Agricultural Engineer.
- „ 72 Lectures for Farmers.
- „ 77 Animals Diseases Amending Ordinance, 1911.
- „ 21 Special Railway Rates for Benefit of Farming Community.
- „ 90 Reports on Experiments—Experimental Station, Salisbury, 1910-1911, by J. H. Hampton.
- „ 22 Importation of Plants Regulations.
- „ 10 Watering and Feeding of Live Stock on Railway.
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Government Notices.

ANIMALS DISEASES AMENDING ORDINANCE, 1911.

Ordinance No. 2, 1911.]

[Promulgated 17th March, 1911.]

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. So much of the "Animals Diseases Consolidated Ordinance, 1904" (hereinafter referred to as the said Ordinance) and of any other law as may be repugnant to or inconsistent with the provisions of this Ordinance is hereby repealed.

2. The Administrator may, on the outbreak of a destructive disease, or when there is suspicion of the existence of such disease, declare an area around and including the place where such disease exists, or is supposed to exist, actively infected for the purpose of this Ordinance.

3. Whenever an area shall have been declared infected in terms of the last preceding section, the Administrator may, for the purpose of suppressing or controlling disease, cause such fences to be erected along the boundaries of or across any farms or land situated in such area as he may deem necessary.

4. (1) If the landowner shall not pay the cost of erecting any fence as aforesaid upon completion thereof, the cost shall be defrayed in the first instance out of moneys provided by the Legislative Council.

(2) When any fence erected as aforesaid runs along the boundary of a farm, the cost of the erection of such fence shall, if not sooner repaid, be repaid, together with interest at the rate of £5 per centum per annum, by equal yearly instalments commencing two years after the fencing is completed, such instalments being so calculated and fixed that the said cost and interest shall be wholly repaid within a period of fifteen years from the date when the first instalment became due.

(3) Such repayment shall be made by the adjoining landowners whose land has been divided by the fence. Each such landowner shall pay one-half the cost of the dividing fence and interest as aforesaid. When the adjoining land is a native reserve, or a portion of such reserve, the one-half of the cost shall be paid from funds in the local Treasury of the British South Africa Company.

(4) When any fence as aforesaid shall be erected within, and not on and along, the boundaries of any farm, the cost shall be paid from the funds of the local Treasury of the British South Africa Company, and the fence, when no longer necessary for the purpose for which it was erected, may be removed by the British South Africa Company; provided that the landowner shall have the right to purchase such internal fence at a price representing the total cost of such fence.

(5) The term "owner" shall mean (a) the person registered as such in the office of the Registrar of Deeds, (b) the British South Africa Company in respect of native reserves, and (c) the local authority in respect of municipalities.

5. Where the bed of a stream or river lies immediately between or constitutes the boundaries of land owned by private owners, the fence may be erected on one or other bank of the river or stream and across it, or partly on one bank, across it, and partly on the other bank, in such manner as may be agreed upon by the owners whose lands are separated by the said stream or rivers. The Administrator may call upon the said owners to agree to the position of the said fence on or before a date fixed by him, and, should they

fail to do so, he may cause such fence to be erected without further reference to the said owners. For the purposes of repayment, such fence shall be considered as dividing the lands of adjoining owners, and half the cost shall be recoverable from each owner whose lands are separated by the said stream or river.

6. The Administrator may call upon any owner whose land has been fenced in terms of section 3 or 12 to provide sufficient security for the payment of any sums that may be due to the British South Africa Company in its local Treasury in respect of such fence. If the owner shall fail or refuse to provide such security, the Administrator may cause a notice in writing to be sent to the Registrar of Deeds of the amount due by such owner, and the Registrar shall make an entry thereof in respect of the land fenced. Such entry shall constitute an hypothecation of the land, ranking from the date on which the entry was made and for the amount therein stated; provided that the Registrar may pass transfer of land so hypothecated if the transferee agrees in writing that any sum due and unpaid shall remain and be registered as a charge against the said land.

7. When any land held under lease or permit of occupation has been fenced in terms of this Ordinance, during the term of such lease or permit the lessee or permit holder shall pay to the proprietor of such land yearly, during the continuance of the lease or permit of occupation, interest at the rate of £5 per centum upon so much of the cost of the fence as the proprietor is liable for, and such payment shall be made with the rent of the land, and shall be deemed in law to be part of such rent.

8. Any tenant or holder of land under a permit of occupation having a right to purchase such land at a fixed price shall, on completion of the purchase, pay to the proprietor, in augmentation and as part of the purchase money, any sum paid by such proprietor for the fencing of such land, and shall become and be liable to repay to the British South Africa Company in its local Treasury such sums as remain unpaid, as the same become due and payable in terms of this Ordinance.

9. Where in the case of any local authority the title to land provides that upon the sale thereof the British South Africa Company shall be entitled to receive a proportion of the purchase price, the local authority shall be entitled to deduct from the purchase price of land sold any debt due or amount paid by it in respect of fences on the land so sold erected under this Ordinance.

10. The provisions of sections 14 and 15 of the "Fencing Ordinance, 1904," in regard to repairs shall, *mutatis mutandis*, apply to fences erected in terms of this Ordinance.

11. Where a fence crosses any road used as of right by the public or by any neighbouring landowner, a properly constructed swing gate shall be placed at the point of crossing.

12. Any person opening such gate, except for the purpose of passing through, or omitting to close such gate after having passed through, and any person damaging such gate and omitting to immediately repair such damage, shall be liable to a fine not exceeding £10, or in default of payment to imprisonment with or without hard labour for a period not exceeding one month.

13. The Administrator may, for the purpose of the more effective prevention or control of disease, apply the provisions of this Ordinance in respect of fencing to municipalities and townships and such land adjoining as may be deemed expedient, and to places within a radius of ten miles of an area declared actively infected in terms of section 2 hereof, if, owing to the number of cattle in such places, or other causes, it appears expedient.

14. (1) The owner or proprietor of the land along the boundaries of which fences have already been erected by the British South Africa Company for the purpose of preventing the spread of African Coast Fever in cattle shall be and is liable to repay to the British South

Africa Company in its local Treasury one-half of the cost of so much of the fence as may be along the boundary of such land. The provisions of sections 7 and 8 of this Ordinance shall apply in the case of land held under lease or permit of occupation along the boundaries of which fences have already been erected. The British South Africa Company may remove any such fence already erected which is within and not on or along the boundaries of any land when no longer necessary for the purposes for which it was erected.

- (2) Any payment due in respect of any such fence may be made as provided by section 4 of this Ordinance, and under the like conditions as to security for such payment as are prescribed under section 6.

15. Within any area declared by the Administrator to be actively infected under the provisions of section 2, or to which the provisions of this Ordinance shall have been applied in terms of section 12, the Administrator may, for the purpose of more effectively preventing the spread of disease, cause to be constructed on any land a dipping tank and any structures incidental thereto or other appliances for the dipping of stock, and may recover the expenditure incurred from the owner of the land on which such tank, structures or appliances have been constructed. The cost of such tanks, structures or appliances shall be paid on the same terms and under the same conditions as are applicable to boundary fences under sections 4, 6, 7 and 8 of this Ordinance.

16. In addition to any penalties that may be imposed under the said Ordinance or any amendment thereof, or under any regulations framed thereunder for the unlawful movement of cattle, the Court of the Magistrate before which the case is tried or the High Court in the like instance may direct the confiscation of any cattle unlawfully removed, and such cattle, if infected with disease or likely to convey infection, shall be destroyed without compensation. Should there be no danger of infection the Administrator may order such cattle to be temporarily kept at any spot denoted by him and then sold. The proceeds of any such sale shall be paid to the British South Africa Company in its local Treasury.

17. Section 11, sub-section (1) of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Should any Inspector, Sub-Inspector or any person specially authorised by the Administrator to carry out the provisions of this Ordinance know or suspect that any animal is infected with any destructive disease, such Inspector, Sub-Inspector or other authorised person may forthwith place such animal in quarantine, together with such land as is necessary, for its isolation, and such animals as have been or are suspected of having been in contact with such animal or with infection. Notice of such quarantine shall be given in writing to the owner or custodian of such animal and to the Magistrate of the district, and shall remain in force for such time as the Chief Inspector or Controller of Stock may direct, unless the Administrator shall sooner, if he thinks fit, issue the notice referred to in sub-section (2) of section 5. A copy of the notice of any such quarantine shall be posted at the office of the Magistrate, and shall be inserted by the Magistrate in some newspaper, if any, circulating in the district.”

18. Section 16 of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Any Government Veterinary Surgeon or any person thereto authorised by the Controller of Stock, Chief Inspector or by a Magistrate may enter any land, building, kraal or enclosure for the purpose of inspecting animals. Should any animal be found to be infected with any destructive disease, or should such infection be reasonably suspected, he may quarantine such animals as in this Ordinance provided, and may order the proper disinfection of any building, kraal or enclosure in which such animal is or may recently have been, and the furniture and fittings thereof. Should it be impossible to properly

disinfect such stable, kraal or enclosure, furniture or fittings in any of them, he may order the destruction thereof; provided that no building, kraal or enclosure shall be destroyed unless the owner consents thereto in writing, or, failing such consent, the Administrator orders that such destruction be carried out."

19. Section 22, sub-section (1) of the said Ordinance is hereby amended by the addition of the following words after the word "obtained" in the twelfth line of the said sub-section, "and any person receiving or taking delivery of any animals without having ascertained that such permit has been obtained."

20. This Ordinance may be cited as the "Animals Diseases Amending Ordinance, 1911," and shall be read as one with the "Animals Diseases Consolidation Ordinance, 1904," and the "Animals Diseases Amendment Ordinance, 1910."

No. 216 of 1911.]

[15th June, 1911.

DESTRUCTION OF WILD CARNIVORA, ETC.

IT is hereby notified for public information that His Honour the Acting Administrator has been pleased to approve payment of rewards for the destruction of wild carnivora, etc., on the scale and conditions herein set forth.

2. Rewards will be paid as follows:—

For each lion	...	...	£5	0	0
For each leopard	...	...	1	0	0
For each cheetah	...	...	1	0	0
For each hyæna	...	...	0	10	0
For each wild dog	...	...	0	10	0
For each crocodile not less than					
3 feet in length	...	...	0	10	0
For each baboon	...	...	0	2	6

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, and to natives by the Native Commissioner of the district, within three months of the date upon which the animal is killed, on a solemn declaration on the prescribed form hereunto annexed.

4. In proof of destruction, applicants for rewards will be required to produce and surrender in the case of a leopard or cheetah the skin with the tail unsevered, and in the case of a hyæna, crocodile, wild dog or baboon the unskinned head. In the case of a lion, to produce the skin and skull, the skull only to be surrendered.

5. The skins and heads surrendered for rewards shall become the property of the Government and shall be disposed of in such manner as may be decided on.

FORM OF DECLARATION.

I,, do solemnly and sincerely declare that I did on the day of and not before, shoot, trap, or poison (as the case may be) (describe the vermin for which the reward is claimed) in the district of within the boundaries of Southern Rhodesia, and that I am entitled to the reward offered by the Government.

And I make this solemn declaration conscientiously believing the same to be true.

.....
Signature.

Signed and declared at this day of

Before me,

.....
Magistrate or Justice of the Peace.

No. 387 of 1911.]

[21st December, 1911.]

DESTRUCTION OF WILD CARNIVORA,

IT is hereby notified for public information that His Honour the Administrator has been pleased to approve payment of rewards for crocodile eggs and crocodiles under three feet in length, in addition to the rewards mentioned in Government Notice No. 216 of 1911, on the scale and conditions herein set forth.

Rewards will be paid as follows:—

For each crocodile egg	6d.
For each crocodile under one foot in length ...	6d
For each crocodile one foot and under three feet in length, 2s.	

Applicants for rewards must produce and surrender the eggs, and in the case of crocodiles under three feet in length, the body with the head and tail not severed.

No. 308 of 1911]

[5th October, 1911.]

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby:

1. Cancel and withdraw section 19 of Government Notice No. 329 of 1910, and in lieu thereof substitute the following:—

"All Cattle within the limits of the various commonages, townships and actively infected areas, or on common grazing ground, shall be dipped or sprayed at least once every three days, unless the Chief Inspector of Stock shall, for sufficient reason, authorise the extension of the time between such dipping or spraying, or the entire suspension of the same.

2. Further amend section 16 of the aforesaid Government Notice by the addition of the following clause to the proviso published under Government Notice No. 200 of 1911:—

"(e) Cattle for *bona fide* farming and dairy purposes may be moved into and within such declared areas, under the conditions of sections 5 and 6 of the above-mentioned Government Notice, and under such other conditions as may be imposed by the Chief Inspector of Stock."

No. 382 of 1911]

[21st December, 1911.]

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," and the "Animals Diseases Amending Ordinance, 1911," I do hereby declare the following area to be actively infected with the disease known as African Coast Fever, for the purpose of the said Ordinances:—

"That part of the native district of Umtali lying south of a line drawn from the eastern beacon of the farm Mabonda; thence along the north-eastern and northern boundaries of same to the northern boundary of Coldstream and the northern boundary of Savillen to the Odzani river; thence down this river to its junction with the Odzi river."

Ordinance No. 18, 1911.]

[Promulgated, 26th January, 1912.]

AN ORDINANCE TO AMEND THE "CO-OPERATIVE AGRICULTURAL SOCIETIES ORDINANCE, 1909."

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof as follows:—

1. So much of the "Co-operative Agricultural Societies Ordinance, 1909"

(hereinafter called the said Ordinance), and of any other law as may be repugnant to or inconsistent with the provisions of this Ordinance, is hereby repealed.

2. Notwithstanding anything to the contrary contained in section 19 of the said Ordinance, the Administrator may, on sufficient cause being shewn, authorise any Society formed thereunder, from time to time to raise a loan involving a liability exceeding £100, or to alter the rules of the Society at a special meeting convened in terms of the said section; provided two-thirds of the members of the Society record their approval thereof by votes in person at such meeting, or in writing in the manner prescribed in the next succeeding section.

3. The person entrusted with the sending of notices calling a meeting for any of the purposes set out in the last preceding section shall send to each member of the Society, together with such notices, a statement setting out concisely the matter to be submitted for the approval of the meeting and a form on which the member to whom it is addressed may record his approval or disapproval by writing the words "yes" or "no" as the case may be. Such form shall be signed by the member using the same and delivered to the person appointed to receive it not later than twenty-four hours before the date of the meeting at which it is to be used.

4. This Ordinance may be cited for all purposes as the "Co-operative Agricultural Societies Amendment Ordinance, 1911."

No. 11 of 1912.]

AFRICAN COAST FEVER.

[11th January, 1912.]

TRANSPORT CATTLE.

UNDER and by virtue of the powers vested in me I do hereby cancel and withdraw Government Notice No. 184 of 1911, and do hereby declare the areas described in the subjoined Schedule A as areas within which the use of cattle for draught purposes may be permitted under the conditions of the regulations governing the movement of cattle.

SCHEDULE A.

1. PLUMTREE.

An area lying west of the Nata and Tjankwa Rivers, from where the latter crosses the farm Tjankwa; thence along the northern boundary of this farm to Burntside; thence bounded by and including the following farms: Burntside, Orange Grove, Glencoe, Stylfontein, Sterkfontein, Ramaquabana Reserve Extension, Empandeni, Home farm, Sleepy Hollow, Castleblock, Ingwesi, Pieter's farm, Lewis's farm, and Mphoeng's Extension.

2. MARULA SIDING.

An area bounded by the eastern boundary of the Plumtree area from the junction of the Manzamnyama and Tjankwa Rivers to Lewis's farm; thence in a south-easterly and easterly direction along the boundary of the area proclaimed under Government Notice No. 254 of 1910, to the Shashani River; thence up that river to the south-eastern beacon of Beaconsfield; thence by and including the following farms: Warnaford, Shashani, Edenvale, Marshlands, Wilfred's Hope, Mananda, Manda, Sherwood and Pandis; thence down the Natane River to its junction with the Manzamnyama River; thence down the latter to the point first named.

3. FIGTREE.

An area bounded by a line drawn from the junction of the Natane and Manzamnyama Rivers to the south beacon of the farm Mananza; thence by and including the following farms: Riverbank, Vunda, Bickley, Beckengham, Penge, Norwood, Ascot Estate West, Welcome, Pendennis, Honeybird-kop, Vreigezicht, La Concorde, De Hoop, Forwards; thence to a point where the Ove

River crosses the southern boundary of Forwards; thence down the Ove River to where it intersects the northern boundary of the farm Ove; thence westerly along the north-west boundary of the farm Ove; thence by and including the farms Undza, Lushongwe, Malala, Kezi and Junction; thence along the southern boundary of Mount Edgecombe to its south-western beacon; thence in a northerly direction along the eastern boundary of the Marula area to the point first named.

4. WESTACRE JUNCTION.

An area embracing the following farms: Joe's Luck, Klipspring, Irene and Col'aton.

5. BULAWAYO AREA.

An area bounded by and including the following farms: Alnwick, Dewsbury, Millievale, Ireland, Bleu Bonny, Craiglea, Stoney Croft, Bilars, Slights, Helenvale, Redbank A, Devonby, Seaborough, Umkien, Fundisi, Imbeza Kraal, Lower Nondweni, Mani, Willsgrrove, 100 acre lots, Claremont, Outspan No. 1 Tuli Road, Emangeni, Inyorka and Sauerdale.

6. HEANEY JUNCTION.

An area including the following farms: Maxim Hill, Three Fountains, Driehoek, Maldon, Imbeza Block, Springs, Hope Valley, Duncal, Kirton and Wilsondale.

7. BEMBESI STATION.

An area bounded by the Heaney Junction and Bulawayo areas as far as the farm Kennebec, thence along the western boundaries of Kennebec, and by and including the farms Kennebec, Galeta's Kraal and Umgusa Block; thence along the north-eastern boundaries of Winter, Spring and Eland to the south-western beacon of Westland Row; thence along the western boundaries of Westland Row, Bembezaan Westgate; thence by and including Goodwood Block, Gourlay's Block, Crescen's Syndicate Block, Lavender Grange, Dromoland, Oscardale, Half Ration Ranche, Wessels, Greenlands, Lochard Block, Rouseville, Inyozan, Fochabers subdivision A, Kodhwayo, Zimbili and Victory.

8. INSIZA NORTH.

An area, with access to Insiza Station, comprising the following farms: Alendale, Ensangu Block, Insangu Reserve, Murray's farm, Frei's farm, and that part of Bulawayo Syndicate Block, Mbatl Tiabetsi Block, lying west of the road from Frei's farm to Insiza Station.

Note.—Access is granted for ox transport from the above-described area to Insiza Station subject to the condition that oxen will not be allowed to cross the railway line.

9. INSIZA SOUTH.

An area bounded by and including the following farms: Blackwaters, Carlssen's Glenorchi, Glenavon, N'dumadombi, Perly Cross, Pioneer farm, Altire, Three Fingers Outspan, Foxdale, Heathfield, Woodstock, Idutwa, Kildare, Lancaster, York, Indina, Wessel's Block, Nauhoho Block, Field farm, Ungungusse, Tekwe Outspan and Magoholo.

10. SHANGANI NORTH.

An area bounded by and including Ruby Block, Blinklip, Zenda, Gillman, Barehill, Ceylon, Clare, Hampton, Torva Block, from the northern beacon of Torva Block along the boundary of Thompson's farm to the Vungu River; thence down the Vungu and Shangani Rivers to the Shangani Reserve; thence along the eastern boundary of the said reserve to the northern beacon of Gourlay's Block; thence along the north-eastern boundaries of Gourlay's and Crescen's Syndicate Blocks to the farm Sunny Ranche, thence by and including the farms Sunny Ranche, Auckland, Manbo, Umsungwa Ranche, and that portion of the Bulawayo Syndicate Block, Mbatl Tiabetsi Block not included in the Insiza North area, Esmyangeni Block, Pongo Outspan; thence along the railway line to the eastern boundary of the East Shangani Block, and thence to the south-eastern boundary of the Ruby Block.

II. SHANGANI SOUTH.

An area bounded by the railway line from the western boundary of the farm Oaklands to the eastern boundary of the East Shangani Block; thence by and including East Shangani Block, Teakwood, Arupanga, De Beer's Block, Virginia, Umchingwe, Umchingwe Block, Greystone Block, Obccoosco, Wolfscrag, Ruins, Albany, Tsinda, Parkyn's farm, and the south-western boundary of Oaklands to the railway.

12. SOMABULA SIDING.

An area bounded by and including the following farms: Dawson's farm, Four Chums, Lewis's farm, West Gwelo Block, Ghoko Block, Brown's farm, Byrne's farm, St. Patrick, Dewhurst, Fairfield, Forfar, Scrub, Woodland and and Kenilworth.

13. GWELO STATION.

An area bounded by a line drawn from a point on the Shangani River where it enters the Shangani Reserve; thence northwards along the boundary of that reserve to the Gwelo River and up that stream to the north-western corner of the Main Belt Block and along the northern boundary of that property to the Que Que River; thence up the Que Que River and the Long Valley Spruit to the northern boundary of the farm Long Valley; thence to the north-western beacon of that farm and along its western boundary; thence along the northern and eastern boundaries of Strathfillan, the southern boundaries of Adair and Wodehouse, the western and southern boundaries of Que Que Reserve; thence along the eastern boundaries of Lochiel, Netherby, Stonefield, Kanuck, Ranjah's Ranche, Dopton, Wildebeeste Block and Safago; thence along the southern boundary of Safago and Divide, Kanuck, and the south-eastern boundary of Watershed Block, and from the most southerly beacon of Watershed Block in a direct line along the eastern and north-western boundaries of the West Gwelo Block to the south-eastern beacon of Somabula; thence along the southern boundary of that farm, Somabula, Meadows, Good Hope, Johnston, and along the western boundaries of Johnston, Vungwana South, Vungwana North, and the south-western boundaries of Walton, Henley, Ensors, Desvages, the Vungu Block, and Thompson's farm to the Vungu River; thence down that river to its junction with the Shangani River, and down that river to the starting point.

14. REDBANK.

An area bounded by and including the following farms: Thornvalley Block, Harris, Stevens, Tableland, Seale, Condene, Redbank B, Richardson's, Bell's, Badminton Block, M'nondu, Ascot Estate, Naseby North and South, Stanhope South, M'kuse, Ches, Luvo and Samunya.

15. NYAMANDHLOVU STATION.

An area bounded by and including the following farms: Moana, Wainoni, Loskey, Cawston Block, Umguzaan Block, Hilda's Kraal, Spring Grange, Rochester, Acutt's and Crewe's Block, Vincents, Alicedale, Imvani, Springs, North Stanhope, Bromley, Eden, Catford, Impanya, Mananza, and from the south beacon of the latter in a direct line to the junction of the Tjankwa and Natane Rivers; thence down the latter to the boundary of the Gwaai Reserve; thence along this boundary in an easterly direction to the south-western boundary of the Seafeld Estate; thence by and including Seafeld, Norfolk, Buchanan, Langvlaagte and Matabeleland Concession.

16. MALINDI STATION.

That portion of Matabeleland within the following boundaries: From a point on the Zambesi road 20 miles south of the Wankies-Deka road along the southern boundary of the Wankies coal area to where it is crossed by the Inyantue River; thence down this river to its junction with the Gwaai River; thence up the latter to the south-east beacon of farm No. 97; thence along the southern boundary of this farm in a straight line to Intundhla Siding; thence in a straight line to where the Manzanmyama River crosses the western boundary of this territory; thence up this boundary to the point started from.

17. WANKIES AREA.

An area including the Wankies coal area and that portion of Matabeleland west of the railway between the southern boundary of the Matetsi area and a line drawn 20 miles south of the Wankies-Deka road.

18. MATETSI SIDING.

An area bounded by a line drawn from the junction of the Kafuli and Matetsi Rivers to Kesi; thence to Missis Pan on the Bechuanaland border; thence along the border in a south-easterly direction to the farm Pandamatenka; thence from the south-western beacon of that farm to the south-western beacon of Guvo along the southern boundary of the latter to the Tshowe road; thence along the latter to the farm Tshowe; thence along the western, southern and eastern boundaries of the latter and in a direct line to the south-western beacon of Railway farm No. 22; thence in a direct line to the first-named point.

19. MATOPO TERMINUS.

An area bounded on the west and north by the Marula, Figtree, Westacre Junction and Bulawayo areas, and from the farm Adams by and including Adams, Florencedale and Absent; thence from the south-eastern beacon of the latter in a direct line to the eastern beacon of Kozi; thence along the northern boundaries of Leilavale and Wenlock Block, and along the western boundary of the latter to its southern beacon; thence along the southern boundary of the Tuli River farm, the north-western boundaries of Goto and Hwatalala, to where the latter is intersected by the Mwewe River; thence by a line due west to the Shashani River.

20. SABIWA SIDING.

An area comprising the following farms: Blanket, Vubachikwe, Hotel, Hampden Place, Insindi Block, Judd's, Wenlock Block, and Sheet.

21. GWANDA STATION.

An area bounded on the north by the Matopo and Sabiwa areas, to the south-eastern boundary of the latter; thence by and including the farms Exchange, Doelfontein, Deney's, Nelson's, Makunkubi, from the southern beacon of the latter along the southern boundary of Jahoonda, the western and southern boundaries of Railway Block No. 2 to the Umzingwani River; thence down the latter to the boundary of the area proclaimed under Government Notice No. 254 of 1910; thence along the latter to the Shashani River; thence up this river to the southern boundary of the Matopo Terminus area.

22. WEST NICHOLSON.

An area bounded by and including Copthall Block No. 2, Rathgar, Forest Hill, Thornwood Block, Macaulay's Jahoonda, Railway Block No. 2; thence from the point where the Umzingwani River crosses the southern boundary of this block, down this river to the boundary of the area proclaimed by Government Notice No. 254 of 1910, along this boundary to the Bubyie River, down this river to the southern boundary of this territory; thence in an easterly and north-easterly direction along this boundary to the Lundi River; thence up this river to where the Tuli-Victoria Column road crosses it; thence down this road to Pilgrim's Rest farm; thence bounded by and including Pilgrim's Rest, Ingwe, Katanga, Sibula, Groot Vlei, Pela, Pirie, Onderbrook, Mubulu, Tubisi, Inanda, Hluku, Vukwe, Bangwe, Inyosi, Olympus Block and River Block.

23. BELINGWE.

An area bounded on the south and east by the West Nicholson area and on the east and north by the Selukwe and Shangani South areas; thence by and including the following farms: The Springs, Bannockburn, Sandeman's farm, Mimosa, Bungwe, Springvale, The Doro, Summer, Mooifontein and Anglo-French Syndicate Block; thence from the southern beacon of the latter down the boundary of Belingwe Reserve No. 2 to the point where the Bubyie River crosses into the farm Grasspan; thence down this river to the boundary of the West Nicholson area.

24. SELUKWE AREA.

An area bounded by a line drawn from the south-western beacon of the farm Lubongo to the Lundi River; thence down the latter to its junction with the Tokwe River; thence up that river to the north-eastern beacon of Idada farm No. 1; thence along the northern boundary of that farm, Selukwe Reserve, Idhwala farm No. 1 and Muirhead; thence along the western boundary of Muirhead and the northern boundaries of Depoto and Tibilikwe; thence along the western boundary of Tibilikwe to the north-eastern beacon of Home; thence along the eastern boundary of Home, Slade's and Lancastershire Estate to the south-eastern beacon of the latter; thence along the southern and western boundaries of Lancastershire Estate, the southern boundary of Wallclose, western boundaries of Hyrcania, Fairview, Figtree, Boulder Beacon, Ghoko Plains, Adamantia and Dorset, and from the south-western beacon of Dorset, along the southern boundaries of Dorset, Clifton, Mkatsi, along the southern boundary of Welsh farm block to the first-named point.

25. SURPRISE SIDING.

An area including the following farms: Wallclose, Beacon Kop, Home, Slade's, Lancastershire Estate and Engesa source.

26. INDIVA SIDING.

An area including the farms Linsdale, Gando, Whawha Outspan, Indiva, Albany, Hashu, Highlands, Umtebekwe, Hainault, Gubire and Elliott.

27. LALAPANZI.

An area bounded by a line drawn from the north-eastern beacon of Linsdale, along the northern boundaries of the farms Linsdale, Gando, Whawha Outspan, the western boundaries of Ingeni, Boulder, Umhlali; thence along the south-eastern boundary of the Que Que Reserve to its north-eastern beacon; thence along the southern and eastern boundaries of Ashdale, the eastern boundaries of Bunsu, Shava, and Oryx to the Sebakwe River; thence up the Sebakwe River to the north-western boundary of the Central Estates; thence following the boundary of that estate to the north-eastern beacon of Kleinfontein and along the northern and western boundaries of that farm, and along the eastern boundaries of Mansfield and Finland to the Tokwe River, down that river to a point due east of the Senangwe Hill; thence to the north-eastern beacon of the Selukwe Reserve and along the northern boundary of that reserve to the south-eastern beacon of Elliott; thence along the eastern boundaries of Elliot, Hainault and Guburie, and the southern boundaries of Partridge and Wojele, and the western boundary of the latter farm to the point first-named.

28. IRON MINE HILL SIDING.

An area included within the following boundaries: From a point where the Iron Mine Hill-Victoria Road crosses the Ngesi River; thence down this river to its junction with the Tokwe River; thence down this river to its junction with the Lundi River; thence down this river to its junction with the Sabi River; thence up the latter to the Umvuma Siding area; thence along the southern boundary of this area to the point started from; thence bounded by and including the Iron Mine Hill-Victoria road from the Ngesi River to Iron Mine Hill Siding, Iron Mine Hill farm, Upland and Kleinfontein farms.

Note.—Pending construction of a railway towards Victoria, transport cattle from this area will be permitted to Umvuma Siding on condition that such cattle return immediately to their own area.

29. UMVUMA SIDING.

An area enclosed by a line from the confluence of the Sabi and Divuli Rivers, up the former to the south-east beacon of Sabi-Oog: thence northwards along the eastern boundaries of Sabi Oog, Sunnyside and Penhoe, and the northern boundaries of Penhoe, Bucknall, Glynn, and Erdington Estate; thence along the western boundaries of Erdington Estate and Morrell to the south-eastern beacon of Mexico; thence along the southern boundary of

Mexico, the eastern boundaries of Adelina and Glengarry, and southern boundaries of Glengarry, Phillipsdale and Christiana to the Ngesi River, and down that river to the Mashaba Hills; thence southwards to the Umniati beacon on the Umniati River; thence direct to the north-western beacon of Welgevonden, and along the western boundaries of that farm, Vrede, Bergeplaats and Bergendale to the Sebakwe River; thence up that river to where the boundary of the Central Estates crosses it; thence along the north-western and south-western boundaries of that estate to a point where it is crossed by the Iron Mine Hill-Victoria road; thence along the north side of that road to the Shashi River; thence down that river to the south-western beacon of Gurajena Reserve; thence following the eastern boundary of the Chilimanzi district to the south-western beacon of Merlin; thence along the southern boundaries of Merlin and Gowrie to the Umtilikwe River; thence direct to Gongwe Hill and along the northern boundary of the Gutu Reserve to the Divuli River, and down that river to the first-named point.

30. HUNTERS ROAD SIDING.

An area bounded by a line drawn from the south-western beacon of Adair, along the western boundaries of that farm and Barkly and the southern boundary of Boschkloof, and along the western and northern boundaries of Long Valley to the Long Valley Spruit and down that stream to its confluence with the Que Que River; thence up that river to the north-western corner of Watermael, along the northern and eastern boundaries of that farm and the eastern boundaries of Shawlands, Loads, Sunbury, Dwaalvlaakte and Wodehouse; thence along the southern boundaries of Wodehouse and Adair to the first-named point.

31. QUE QUE STATION.

An area bounded by a line drawn from the north-east corner of Oryx down to the Sebakwe, Umniati and Sinyati Rivers to the junction with the Zambesi, up that river to its junction with the Sengwe, and up that river to its junction with the Lutopi River; thence in a straight line to the junction of the Shangani and Gwelo Rivers, and up the latter to the north-west corner of the Main Belt Block; thence along the northern boundary of that block to the Que Que River, up that river to the most westerly corner of Watermael, along the northern and eastern boundaries of that farm, Shawlands, Loads, Sunbury, Dwaalvlaakte, Wodehouse, Ermelo, Umsungwe Block, to the most southern beacon of the Que Que Reserve; thence along the south-eastern boundary of Que Que Reserve to its north-eastern beacon; thence along the southern boundary of Ashdale; thence along the eastern boundaries of Ashdale, Bunsu, Shava, Oryx, to the starting point.

32. BATTLEFIELDS.

An area within the following boundaries: From the junction of the Umsweswe and Umniati Rivers, up the latter to the Mashaba Hills; thence along these hills in a northerly direction via the Bumbi beacon to the Umsweswe River; thence down this river to the point started from.

33. HARTLEY AND GATOOMA.

An area bounded by a line drawn from the confluence of the Umfuli and Umniati Rivers; up the latter to its junction with the Umsweswe; thence up the latter to the Mashaba Hills; thence southwards along that range to the Bumbi beacon; thence in a straight line southwards to the Ngesi River; thence up that river to the eastern boundary of the Mondoro Reserve; thence in a north-easterly direction along the eastern boundary of the same to the Dorango River; thence down this river to the Umfuli, thence down the Umfuli to the point first named.

34. GADZEMA STATION.

An area bounded by a line drawn from the confluence of the Umsengaisi and Umfuli Rivers, up the latter to the drift on the old Hartley-Salisbury road; thence northwards to the south-western beacon of Railway Farm No. 22, along the western boundary of that farm and the eastern boundary of Railway Farm No. 21 to its north-eastern beacon; thence in a northerly

direction to Hunyani Poort; thence westwards in a straight line to the Umsengaisi River, and along that river to the point first named, including Reynardia.

35. MAKWIRO STATION.

An area bounded by a line drawn from a point on the Umfuli River at the drift on the old Hartley-Salisbury road; thence northwards to the south-western beacon of Railway Farm No. 22; along the western boundary of that farm and the eastern boundary of Railway Farm No. 21 to its north-eastern beacon; thence in a northerly direction to Hunyani Poort; thence up the Hunyani River to the western boundary of the Hunyani Estate; thence along the western and southern boundaries of that estate to the north-western beacon of Railway Farm No. 29; thence along the western boundary of that farm and the eastern boundary of Railway Farm No. 28, Makwiro Source and Ardmore; thence in a straight line to the north-eastern beacon of the farm Fort Martin; thence along the eastern boundary of that farm to its south-eastern beacon; thence due south to the Umfuli River and down that river to the first-named point.

36. NORTON SIDING.

An area bounded by a line drawn from the junction of the Gwibi and Hunyani Rivers, along the eastern boundary of the Hunyani Estate; thence along the northern and western boundaries of Railway Farm No. 29 and the eastern boundaries of Railway Farm No. 28, Makwiro Source and Ardmore; thence in a straight line to the north-eastern beacon of the farm Fort Martin; thence along the eastern boundary of that farm to its south-eastern beacon; thence due south to the Umfuli River and up that river to its junction with the Doranango; thence up this river to the western boundary of the Mondoro Reserve and along the boundary of this reserve to the Ngesi River; thence up this river to the south-western beacon of the farm Christiana and along the southern boundaries of that farm, Phillipsdale, Glengarry and Adelina; thence along the eastern boundaries of the latter, Mexico and Revelant to its northern beacon; thence northwards to the old Charter-Salisbury road and along this road to the Hunyani River; thence down this river to the point first named.

37. HUNYANI TANK.

An area including the following farms; Lowlands, Gordonias, Aberdeen, Rietbuck Outspan, Herren Hausen, Saffron Waldron, Riverside, Lyndhurst, Kilworth, Porta Outspan and Clement's Plot.

38. 1645½ PEG, B. & M. & R. RAILWAYS.

An area including the farms Warwickshire, Sublime, United, Stonehurst, Somerby, Spitzkop, Doornfontein, Sunnyside and Lilfordia.

39. SALISBURY A.

An area, with access to Salisbury, comprising the following farms: Ingleborough, Lowdale, Eskbank, Calgary, Oldbury, Komani, Thornpark, Thetford and St. Gerera.

40. SALISBURY B.

An area comprising the following farms: White Cliff, Parkridge, western half of Fontainbleu, Heany, Oatlands, Amalinda, Ingwe, Willowvale, The Rest, Langford and Saturday Retreat.

41. SALISBURY C.

An area, with access to Salisbury, bounded by and including the following farms: Henricksen, Bluff Hill, Tynwald, eastern half of Fontainbleu, Lochinvar, Makabusi Outspan, Hopley, Odar Outspan, Longlands, St. Mary's, Iddesleigh Extension, Harveydales, Twentydales, Glenwood, Adelaide, Ventersburg, Epworth, Hatfield, Prospect, Waterfall, Warren and Mabel Reign.

42. SALISBURY D.

An area, with access to Salisbury, bounded by and including the following farms: Pote, Balkize, Willesdon, Sussexdale, Welston, Teviotdale, Pomona,

Rietfontein, The Nursery, Greendale, Reserve, Donnybrook, Dispute, Sebastopol, Caledonia. Father Hartmann's farm, Chishawasha, Stuhm, The Springs, The Grove, Umritsur, Borrowdale Estate, Thelksindi, and the Chindamora Reserve.

43. ARCTURUS.

An area consisting of the following farms: The Craig, Kilmuir, The Meadows, Mount Shannon, Halstead, Bally Vaughan, Saratoga, Marsala, Frascati, Strathlorne, Ivordale, Devonia, Rudolphia, Thornvlei, Alderley, Learig, Gilnockie, Gardiner, Mabfen, Retreat, Guernsey, Grazeley, Lonely Park, Chinyika, Orion, Reserve, Colga, Oribi, Ivanhoe and the Chikwaka and Msana Reserves.

44. BROMLEY SIDING.

An area bounded by and including the following: Kunzwi Reserve, farms Kinahan, Rochester, Belvedere, Bellevue, Belmont, Ruwa, Bain's Hope, James, The Glebe, Galway Estate, Deanesbrook, Nalira Reserve, Buenavista, Seki Reserve, Shiota Reserve, Great Bromley Estate and Weardale.

45. MARANDELLAS NORTH.

An area including the following farms: Musi, Peddie, Southampton, Roraima, Essexvale, Rockery, Progress, that portion of Lendy north of the railway line, Longlands, Shortlands, Loquat Grove, Helm, Cotter, Rapid, Revolt, Rokodzi, Springvale, Retreat, Pirate, Bovey Tracey, March, Rocklands, Forest Range, Cornwall, Somerset, Dorset, Buckingham, Sunny Fountains, Mangwendi Mission, Tiller, Rapture, Warwick, Cambridge, Nandu, Argosy, Rupture, Dormervale, Oxford, Norfolk, Surrey, Sussex, Suffolk, Kent, Middlesex.

Note.—Access will be granted for ox transport from the above-described area on to Uplands subject to the condition that no such wagons be outspanned on the south side of the railway.

46. MARANDELLAS SOUTH.

An area bounded by a line drawn from the most northerly beacon of Gatzji, along the western boundaries of that farm and Nolans, and the southern boundaries of Retreat, Springvale, Rakodzi, Longlands, and from the southernmost beacon of that farm along its western boundary to the railway; thence westwards along the railway to where it enters Peddie; thence along the eastern and south-western boundaries of Musi, and the western boundaries of Hedon, Stow, Nungubi Mission, Rhodesdale, Poltimore, Endsleigh, Chudleigh, Bickleigh, Saltash and Balmoral, and from the south-west of Balmoral along the western boundaries of Corfe, Vergenoeg and Good Hope to the Sabi River, and thence down that river to its junction with the Macheke River, up the latter to the Rusawi River; thence up the Rusawi River to the farm Tweedjan; thence along the eastern boundaries of Tweedjan, Nyakurwi, Elandslaagte, Summerslust, Delta, Soshwi Reserve, De Ay, Boom, Ta-ra-ra, Nolans and Gatzji, to the point first-named.

Note.—Access will be permitted for draught oxen from the transport area immediately to the north of that herein described on to Uplands, provided such wagons are outspanned only to the north of the railway.

47. MACHEKE STATION.

An area bounded by a line drawn from the north-western beacon of Showers, along the western boundaries of Showers, Gongwe, Magar, northern and western boundaries of Highlands, north-western and south-western boundaries of Allen, western boundary of Holton Estate, western and southern boundaries of Belmont Outspan, north-western boundary of White Gombola, western boundaries of Bonn, Calne, Wilton, western and southern boundaries of The Cave, and the southern boundary of Mere; thence up the Macheke River to the north-western beacon of the Monte Cassino; thence along the southern and eastern boundaries of Monte Cassino to its most northern beacon; thence in a direct line to the south-western beacon of Changwe Ranche No. 1; thence along the southern and eastern boundaries of Changwe Ranche No. 1 and the north-eastern boundary of Changwe Ranche No. 2 to the Mafuri River; thence down this river to the eastern boundary of

this territory; thence along this boundary in a northerly direction to the Mazoe River; thence up this and Inyagui Rivers to where the latter enters the Marandellas North area; thence in an easterly direction along the boundary of this area to the north-west beacon of Showers.

48. HEADLANDS STATION.

An area bounded by the Umfuri River from where it intersects the north-eastern boundary of Changwe Ranche No. 2, down the Umfuri to its junction with the Ruenya River; thence in a southerly direction up this river to the north-eastern corner of Rathcline; thence along the northern boundary of Rathcline, and the northern and western boundaries of the Inyati block to the south-eastern beacon of Trelawny; thence along the southern boundary of Trelawny; thence in a direct line to the north-east beacon of Nyamangura; and along the eastern boundaries of that farm and Maringowie; thence in a direct line to the north-eastern beacon of Lone Kop; thence southwards and westwards along the boundaries so as to include the farms Lone Kop, Moodie's Vale, Emerald, Netzewa, Leuwpoot, Lesbury and The Willows; thence up the Macheke River to the southern beacon of Monte Cassino; thence along the southern and eastern boundaries of that farm and from its most northern beacon in a direct line to the south-western beacon of Changwe Ranche No. 1; thence along the southern boundary of Changwe Ranche No. 1 to the eastern boundaries of Changwe Ranches Nos. 1 and 2 to the first-named point.

49. JUNCTION, MAZOE AND LOMAGUNDI RAILWAYS.

An area comprising the following farms: St. Marnock's, Kinvarra Haydon, Good Hope, Stamford, Gillingham, Rainham, Outspan, Homefield, Stapleford, Glenlussa.

50. 23-MILE PEG, LOMAGUNDI RAILWAY.

An area including the following farms: Derry, Penrose, Killimore, Inkomo, Dryham, Syston, The Lily, Ballineety, Bitton, Doynton, Yate, Sandringham, Sandown, Nauweplaats, Outspan, Mooi Leege, Jackal's Loop, Sandhurst, Warley, Umvukwe Oog, Oakwoods, Goede Hooft, Oodekraal, Kleinkopjes, Leuww's Rust, that portion of the Barwick Estate within the native district of Mazoe.

51. PASSAFORD STATION.

An area consisting of the farms Umsasa, Mbebi, Springvale, Passaford, Estes Park, Spa, Fairview, Weltevreden and Makay.

52. 35-MILE PEG, LOMAGUNDI RAILWAY.

An area including the following farms: Cardiff, Wellesley, Sodbury, Kingswood, Greenside, Oldlands, Pucklehills, Little England, and the Gwibi Reserve.

53. GWIBI TANK HALT.

An area including the following farms: Darwendale, Hunyani Estate, Gwibi Junction, Eclipse block, Dowend, Charfield and Fish Ponds.

54. BANKET, LOMAGUNDI.

An area lying to the south and east of a line drawn from the north-eastern corner of the Umvukwe Ranche, along the north and west boundaries of that property; thence to the north-western corner of Nzashoa, along its western boundary to the most westerly beacon of the Barwick Estate; thence to the junction of the Maquadzi and Mennini Rivers; thence to the 75 mile peg on the Banket-Aryshire Railway; thence westward to the northern beacon of Glenluce and along its northern boundary to the Msenge River; thence up the Msenge and Doondo Rivers to the source of the latter; thence to the Kanumbgwi Hill; thence westward to the Hunyani River and up that river to the Hunyani Estate; thence in a northerly direction along the north-west boundaries of the Gwibi Tank Halt, 35 mile peg Lomagundi Railway, 23 mile peg Lomagundi Railway, and Mazoe areas to the point started from.

55. ELDORADO, LOMAGUNDI.

An area bounded by a line drawn from the north-eastern corner of

Umvukwe Ranche along the north-western corner of Nzashoa along its western boundary and to the western beacon of the Barwick Estate; thence to the junction of the Maquadzi and Mennini Rivers; to 75 mile peg on the Banket-Ayrshire Railway; thence westward to the northern beacon of Glenluce and along its northern boundary to the Msenge River; thence up the Msenge and Doondo Rivers to the source of the latter; thence to the Kanumbgwi Hill; thence westward to the Hunyani River and up that river to Hunyani Poort; thence along the northern boundary of the Gadzema Station boundary to the Umfuli River; thence down this river to the Zambesi River; thence along the northern boundary of this territory to the Umsengesi River; thence up this river and the Utete River to its source, and thence in a direct line to the point started from, excluding Reynardia.

56. SELBY SIDING.

An area comprising the following farms: Madzugetu, Mount Hampden Reserve, Bendauch, Glengara, Mgutut, Mayfield, Patterson, Selby, Pearson Settlement, Sigaro, Nalire.

57. MAZOE.

An area lying north of a line drawn from the south-western beacon of Moore's Grant along the southern boundaries of that estate; thence along the western and southern boundaries of the Howick Estate and Burley Bottom to the north-western beacon of Belford Estate No. 2; thence along the western and southern boundaries of Belford Estate to the westernmost beacon of Springvale; thence along the north-western boundary of Springvale, the western, northern and eastern boundaries of Msasa, the eastern boundaries of Mabebe and Springvale to the western boundary of Great B.; thence along the western, southern and eastern boundaries of Great B. to the southernmost beacon of Arnold's; thence in a line east to the western beacon of Pote; thence along the northern boundary of that farm to the Poorte River, down the Poorte River to the south-eastern beacon of Gosforth; thence along the eastern and northern boundaries of this farm, the eastern boundary of Avonduur, the southern, eastern and western boundaries of Geluk; thence following the western boundaries of the farms Simoona Reserve, Ireniedale, Dunmaglas, Duntarvie, and Makori; thence in a straight line to the western beacon of Chomkuti, along the western boundaries of that farm, Dunaverty, Lagnaka, Maparu and Hinton; thence down the Ruia River to the southern boundary of Lawley's Concession; thence following its southern and western boundaries, the western boundary of the Chiweshwe Reserve to its north-west beacon at Banalombizi; thence west in a straight line to the boundary of the Eldorado-Lomagundi area.

58. KIMBERLEY REEFS.

An area described by a line drawn from the south-eastern beacon of Gosforth; thence along the eastern and northern boundaries of this farm, the eastern boundary of Avonduur, the southern, eastern and northern boundaries of Geluk; thence following the western boundaries of the farms Geluk, Simoona Reserve, Ireniedale, Dunmaglas, Duntarvie and Makori; thence in a straight line to the western beacon of Chomkuti, along the western boundaries of that farm, Dunaverty, Lagnaka, Maparu and Hinton; thence down the Ruia River to the southern boundary of Lawley's Concession; thence following its southern and western boundaries, the western boundary of the Chiweshwe Reserve to its north-west beacon at Banalombizi; thence west in a straight line to the boundary of the Eldorado-Lomagundi area; thence along the boundary of this area in a northerly direction to the boundary of this territory; thence in a south-easterly direction along this boundary to the Mazoe River; thence up the Mazoe River to the junction of the Inyagui; thence up the latter to the eastern beacon of the Msana Reserve; thence along the northern boundary of that reserve to Mount Murgive Masimbi; thence along the southern boundaries of the Farms Nabgwe, Ceres, Woodlands, Hereford and The Vale; thence in a northerly direction from the south-western beacon of The Vale to the north-western beacon of Bonny, following up the course of the Poorte River to the first-mentioned point, *i.e.*, south-eastern beacon of Gosforth.

59. ESSEXVALE AND BALLA BALLA AREAS

An area bounded by and including the following farms: Glen Grey, Bushy Park, Napier's, Springvale, Mzingwani Reserve, Worringham, Hilton, Ballarat, Essexvale, Glen Lategan, The Range, Clarke's, Swaithe's, Limerick, Pioneer's Rest, Hayhill, Rietfontein, Blagdon, Fairview, Hamilton, Mayfair, Rathline, Westondale, Outspan No. 2 Belingwe Road, Spiiz Kop, and Yazani.

60. STANMORE SIDING AREA.

An area bounded by and including the following farms: Longfield, Lynch's, Irisvale, New Brighton, Charter, Penalverne, Rhodesia Limited No. 2, Glass block, Railway block No. 1, Lendy's, Hollins' block. Draaispruit, Zwemele block, Leilavale; thence from the eastern beacon of Kozi in a direct line to the south-west beacon of Absent to its north-eastern beacon; thence along the southern boundary of Essexvale to the western beacon of Glen Lategan; thence along the western boundaries of Glen Lategan and the Range to the farm Longfield.

61. FILABUSI AREA.

An area bounded by and including the following farms: Outspan, Doornboom, Bele, Buffelsfontein, Nyamini, Insiza, Manzanymama Reserve, St. Andrews, Panasequa, Eldorado, Fairgrove, Folley's Luck, Amazon, Mosenthal's, Chelo, Cala, Xalanga, Bolo, Scott's Hope, Lions' Lair, Honeyvale, Wallaceville, Comyn Dell, Tandausi, Luttrell's Town (north and south), Mivele, Tsomo, Xuka, Uyanezi, Inyezi, Leeuwhoek, Ingwenya, Hillside, Fernkloof, Itaga, Krantzklloof, Grasspan, from the latter down the Buby River to the north-east beacon of Lubisi; thence along the northern boundaries of Lubisi, Inanda, Hluku, Vukwe, Bangwe, to the most easterly beacon of Outspan.

No. 50 of 1912.]

[8th February, 1912.

AFRICAN COAST FEVER.

Regulations regarding the movement of cattle and the prevention and suppression of disease.

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 329 of 1910 and 308 of 1911 and make the following provisions in lieu thereof:—

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

General Movement.

3. For the purpose of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission:—

- (a) Single farm.
- (b) Two or more adjoining farms, farmed together under one management and situated within one cattle transport area.
- (c) An area, the property of one owner, enclosed by a substantial fence.
- (d) For grazing purposes, an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land.

The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease, or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission, in writing, of an Inspector, Sub-Inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall permit the movement of cattle

- (a) Without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the district over which land or reserve such cattle will pass, whether along roads or otherwise; provided, however, that refusal to grant such consent shall be in writing, and provided further that if the Controller of Stock or the Chief Inspector shall consider that such consent is withheld without good and sufficient cause he may permit of movement without such consent.

If any such person mentioned above refuse to give consent or to state a reason for refusing to do so in writing, no valid objection shall be deemed to exist and movement may be permitted without such written consent.

- (b) Within a veterinary district as defined in the schedule annexed hereto from one transport area to or through another without the consent of the Cattle Inspector in charge of such area.
- (c) From any veterinary district to or through another without the consent of the District Veterinary Surgeon of such district.

Slaughter Cattle.

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same except for the purpose of being slaughtered at the appointed abattoir, and if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock; provided, however, that the Chief Inspector may allow the removal of cattle from such an area under such conditions as he may prescribe.

Transport Cattle.

9. The use of cattle for draught purposes is prohibited except:—

- (1) Within the boundaries of the places defined in section 3, (a), (b) and (c) hereof.
- (2) Within the boundaries of areas already fixed for the use of cattle for draught purposes in terms of regulations published under Government Notice No. 329 of 1910, or such other areas as may be fixed by the Administrator.

10. Notwithstanding the provisions of section 9, no permit shall authorise the working of cattle

- (a) which are not clearly and distinctly branded with the registered brand of the owner;
- (b) in any wagon or vehicle which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

11. No wagon or other vehicle drawn by oxen shall be moved from one cattle transport area into another without the permission of the Cattle Inspectors concerned, and under such conditions as they may impose.

General Provisions.

12. On the outbreak or suspected outbreak of disease, the Administrator may declare an area of infection around and embracing the place of outbreak or suspected outbreak, and a further area or areas around such area of infection as a guard area, whereupon all movement of cattle into and from place to place within such area or areas shall be immediately suspended, except as is hereinafter provided.

A.—*In areas of infection and guard areas :—*

- (1) Cattle in transit by rail may be moved through such area.
- (2) Cattle from beyond the borders of Southern Rhodesia may be detained within such area or areas *en route* to destination.
- (3) Cattle for *bona fide* farming, dairy and slaughter purposes may be moved into such area or areas by permission of the Chief Inspector and under such conditions as he may impose.

B.—*In guard areas only :—*

Cattle may be moved into and from place to place within such area under the conditions of section 6 hereof.

13. The removal of green forage, hay, fodder, bedding reeds, manure or of such other articles as may reasonably be supposed capable of conveying infection, shall be prohibited from areas of infection, save and except with the special permission of the Administrator.

14. Whenever an area shall have been declared under section 12 hereof, every person within such area, or within such further area as may be specified by Government Notice, owning or in charge of cattle shall, upon the death or slaughter because of disease, suspected disease, or accident, of any such cattle, immediately report such occurrence through the nearest Cattle Inspector, Native Commissioner or Police Officer to the District Veterinary Surgeon.

15. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

16. Whenever an area shall have been declared an area of infection or guard area in terms of section 12 hereof, any person who shall allow any cattle to stray or be otherwise removed, except as provided for in these regulations, from any one place within such area to another place, or from a place outside of to a place within such area, shall be guilty of an offence against these regulations.

17. All cattle within the limits of the various commonages and townlands, areas of infection and guard areas as declared under section 12 hereof, or depastured on common grazing ground, shall be dipped or sprayed at least once in every three days, unless the Chief Inspector shall authorise the extension of the time between such dipping or spraying, or the entire suspension of the same.

18. In all areas of infection and guard areas sheep and goats shall be dipped at such periods as may be directed by the Chief Inspector.

19. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Chief Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

20. All permits for the removal of cattle issued under the provisions of the said Ordinance or of any regulations framed thereunder shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

21. No permit issued for the movement of cattle shall be taken to authorise any trespass in connection with such movement.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road,

public outspan, commonage, or any property other than that of the owner, unless they are free from ticks or unless they have been effectively cleansed by dipping, spraying or other process, within fourteen days of being allowed on such road or other place. Any beast having ten or more ticks on it shall not be considered free from ticks.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months,

SCHEDULE "A."

VETERINARY DISTRICTS OF SOUTHERN RHODESIA.

(1) *Salisbury.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

32. Battlefields; 33. Hartly and Gatooma; 34. Gadzema Station; 35. Makwiro Station; 36. Norton Siding; 37. Hunyani Tank; 38. 164½ Peg B. & M. & R. Railways; 39. Salisbury A.; 40. Salisbury B.; 41. Salisbury C.; 42. Salisbury D.; 43. Arcturus; 44. Bromley; 45. Marandellas North; 46. Marandellas South; 48. Headlands Station; 49. Junction, Mazoe and Lomagundi Railways; 50. 23-Mile Peg, Lomagundi Railway; 51. Passaford Station; 52. 35-Mile Peg, Lomagundi Railway; 53. Gwibi Tank Halt; 54. Banket, Lomagundi; 55. Eldorado, Lomagundi; 56. Selby Siding; 57. Mazoe; and 58. Kimberley Reefs.

(2) *Bulawayo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

1. Plumtree; 2. Marula Siding; 3. Figtree; 4. Westacre Junction; 5. Bulawayo Area; 6. Heaney Junction; 7. Bembesi Station; 8. Insiza North; 9. Insiza South; 10. Shangani North; 11. Shangani South; 14. Redbank; 15. Nyamandhlovu Station; 16. Malindi Station; 17. Wankies Area; 18. Matetsi Siding; 19. Matopo Terminus; 20. Sabiwa Siding; 21. Gwanda Station; 22. West Nicholson; 23. Belingwe; 59. Essexvale and Balla Balla Areas; 60. Stanmore Siding Area; 61. Filabusi Area.

(3) *Gwelo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

12. Somabula Siding; 13. Gwelo Station; 24. Selukwe Area; 25. Surprise Area; 26. Indiva Siding; 27. Lalapanzi; 28. Iron Mine Hill Siding; 29. Umvuma Siding; 31. Que Que Station.

(4) *Umtali.*

An area comprising the native districts of Umtali, Melsetter, Makoni and Inyanga.

No. 59. of 1912.]

[8th February, 1912.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notices Nos. 142 of 1910, 14, 33, 106 and 154 of 1911, and also Government Notices Nos. 303 and 382 of 1911, except as is hereinafter provided, and in terms of section 12 of Government Notice No. 50 of 1912 declare the following areas of infection and guard areas for the purpose of the said Ordinance:—

1.—*Native Districts of Umzingwani, Bulawayo, Matopo and Bubi.*(a) *Areas of infection.*

- (1) The south-western portion of Sauerdale and the south-eastern portion of Alnwick included in the same fence.
- (2) The farms Adams, Emangeni, Inyorka and Ballarat and that portion of Essexvale Estate known as the North Paddock which adjoins the farm Ballarat on its eastern boundary.
- (3) The farms Springs, Hope Valley and Duncal.
- (4) The fenced sub-division of Bulawayo Commonage which includes the Township, Suburbs and Hillside Township.
- (5) Induba farm.

(b) *Guard area.*

An area bounded by and including the following farms—Lochard block, Half Ration Ranche, Chilton, Fincham's, Robert block, Induna, Waterfall, Dingaan, Rouxdale, Fundisi, Helenvale (excluding farms Nos. 1, 3 and 16), Slughts, Billars, Stonycroft, Craiglee, Blewbonny, Millievale, Dewsbury, Joe's Luck, Klipspring, Irene, Lucydale, Bedza, Anglesea, Excess, Mineral King, World's View, Matopo block, Mission Farm Brethern in Christ, Absent, that portion of the Matopos lying north of a line drawn from the south-eastern beacon of Absent to the north-western beacon of Longfield, The Ranges, Clarke's, Swaithe's, Limerick, Pioneer's Rest, Hayhill, Reitfontein, Bradford, Hamilton, Mayfair, York, Indina Rathline, Westondale, sub-division A, Fochabers, Kodhwayo, Zimbile and Lochard Outspan.

2.—*Goromonzi District*(a) *Area of infection.*

The farms Stamford, Homefield, Rainham, Gillingham, Outspan, Fontainbleu, Tynwald and Hayden.

(b) *Guard area.*

An area including the following farms:—Stapleford, Glen Lussa, Sunny-side, Doornfontein, Spitzkop, Whitecliff, Heaney, Parkridge, Willowvale, Lochinvar, Warren, Mabel Reign, Salisbury Commonage, Avondale, Zizalisari Outspan, Bluff Hill, Good Hope, Henrichsen, Mt. Hampden Reserve, Kinvarra, St. Marnock's, Thorn Park, Mt. Hampden Outspan, Komani, Arden and Gwibi Government Farm.

3.—*Umtali District.*(a) *Area of infection.*

Umtali Commonage.

(b) *Guard area.*

An area bounded by a line drawn from the eastern beacon of Mabonda along its north-eastern and northern boundaries, thence along the northern boundaries of Coldstream and Savillen and from the north-western beacon of the latter farm along its western boundary to the Odzahi River, thence down this river to its junction with the Odzi, thence down the Odzi to the south-east beacon of Gilmerton, thence along the southern and eastern boundaries of the latter, the south-eastern boundaries of Zimunga Reserve and Howth, the southern boundaries of Greendale, Scandanavia, Norseland and Valhalla to the Portuguese boundary, thence in a northerly direction along this boundary to the first-named point.

4.—*Melsetter District.*(a) *Area of infection.*

The farms Tilbury, Dunstan, Sauerombi and Lindley.

(b) *Guard area.*

An area bounded by the Nyanadsi River on the north, the Nyfodi River on the east, the Lisitu River on the south, and including Ingorima Reserve, Bloemhof, Cambridge, The Drifts and Welgegend.

5.—*Inyanga and Makoni Districts.*(a) *Area of infection.*

An area bounded as follows:—From the railway bridge over the Lesapi River to the junction of the Lesapi and Chimbi Rivers, up the latter to the southernmost beacon of the farm Chimbi, along the southern and western boundaries of Chimbi to the north beacon of the same, thence to the north beacon of Not-got-'em-yet, thence in a straight line to the south-west beacon of Rathcline and along its southern boundary, thence in a straight line to Mounts Zewa and Bayahura and southward along the Anglo-Portuguese frontier to the Hondi River following the southern boundary of the Inyanga native district to the Nyatanda River, thence to the southern boundary of the Makoni Reserve and along it to the southernmost beacon of Mt. Zonga Farm; thence along its southern boundaries to the eastern beacon; thence west to the Inyamapamberi River, down this river to the north-western beacon of Tiny; thence along the eastern boundary of the Chiduka Reserve to the Lesapi River, up this river to the railway bridge.

(b) *Guard area.*

An area comprising the native districts of Inyanga and Makoni, excluding (1) the area defined in (a) hereof, (2) the Headlands transport area, as defined by Government Notice No. 11 of 1911.

The area set forth in Government Notices Nos. 303 and 382 of 1911 will remain areas of infection for the purposes of the "Animal Diseases Amending Ordinance, 1911."

No. 35 of 1912]

[25th January, 1912

IMPORTATION OF PLANTS, ETC., REGULATIONS.

WHEREAS the insect pest known as San Jose or pernicious scale (*Aspidiotus perniciosus*, Comstock) has been discovered infesting nursery stock, fruit trees and other plants in the Province of Natal in the Union of South Africa.

Now, therefore, under and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that, from and after this date and until further notice, the introduction into Southern Rhodesia of any plant or plants, not being fruit, seeds, bulbs, cut flowers, vegetables or vegetable transplants, grown in the Province of Natal in the Union of South Africa is prohibited, unless special permission in respect of each consignment be first obtained from the Director of Agriculture, Salisbury, Southern Rhodesia.

No. 36 of 1912]

[25th January, 1912

BLACK QUARTER OR SPONSZIEKTE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby withdraw the quarantine and restrictions placed on the farms mentioned in Government Notice No. 218 of 1911 in so far as they relate to the above-mentioned Ordinance.

No. 41 of 1912.]

[1st February, 1912.

FENCING ORDINANCE, 1904.

UNDER and by virtue of the powers conferred upon me by the "Fencing Ordinance, 1904," I do hereby define the area as described hereunder

to be a district for the purpose of the said Ordinance, and, in terms of section 4 thereof, bring the provisions of the said Ordinance into operation in the aforesaid district.

DESCRIPTION OF AREA.

That portion of the native district of Selukwe within the following boundaries :—

From the north-east beacon of the farm Depoto, along the eastern boundary of that farm and the farms Umcima, Adare, Selukwe Peak, Outward Bound, Pont Vaen and Ortner's to the south-eastern beacon of the latter; thence along the southern boundary of Ortner's and the eastern, southern and western boundaries of Brooklands, the western boundaries of Aberfoyle Block, Educational, Wall Close and Kanuck to the north-eastern beacon of the latter; thence along the northern boundaries of Kanuck, Divide, Educational, Safago, Tibilikwe and Depoto to the point first named.

No. 47 of 1912.]

[8th February, 1912.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby authorise the importation, from the United States of America, of cattle required for *bona fide* breeding purposes, provided, however, that such importation shall be subject to the provisions of Government Notice No. 110 of the 16th April, 1908, relating to the importation of cattle from the United Kingdom of Great Britain and Ireland.

No. 51 of 1912]

[8th February, 1912

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the conditions of section II of Government Notice No. 25 of 1909 to be in force in the native district of Victoria for a period of two months from 11th February, 1912, and in the native district of Ndanga for a period of two months from date of this notice.

No. 203 of 1911.]

[15th June, 1911.

GAME LAW CONSOLIDATED ORDINANCE, 1906.

UNDER and by virtue of the powers conferred upon me by the "Game Law Consolidation Ordinance, 1906, I do hereby extend the provisions of Government Notice No. 40 of 1909, as amended by Government Notices Nos. 128 and 129 of 1909, for a further period of one year from the 30th June, 1911.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.
Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 160 of 1910 withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1911, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Bulawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

[15th August, 1911.]

IMPORTATION OF STOCK FROM EUROPE.

IT is hereby notified for public information that, owing to an outbreak of Foot and Mouth Disease in Holland and Great Britain, the Union Government has published regulations prohibiting all importation of cattle, sheep and pigs from the Continent of Europe and Great Britain. Provision has, however, been made for the admission of animals already on board ship, subject to inspection and such conditions as the Minister for Agriculture may see fit to impose.

No. 353 of 1911.]

[16th November, 1911.]

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby suspend the operations of sections 9, 10 and 12 of the said Ordinance until the 30th November, 1912, in regard to game in class "B," and the following game in class "C," viz.:—Eland, koodoo, zebra and Burchell's zebra or quagga, within the following area:—

DESCRIPTION OF AREA.

An area bounded by a line drawn from the junction of the Merowa and Umfuli rivers, up the Umfuli to its junction with the Susenje, thence up the Susenje and Massome rivers to the headwaters of the latter; thence to the drift where the Sinoia-Urungwe road crosses the Inyonga river; thence northerly along this road to the Chidzurgwe hill; and thence direct to the junction of the Merowa and Umfuli rivers.

No. 295 of 1908.]

[1st October, 1908.]

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed existence of destructive diseases affecting the said animals in the said countries:—

- (1) All animals from the island of Mauritius.
- (2) All animals from German South-West Africa and all animals except donkeys from German East Africa.
- (3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.
- (4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.
- (5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingswilliamstown, Komgha, Peddie, Somerset East, Stockenström, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

(1) Plumtree shall be regarded as the port of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Office at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detrained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of Melssetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sawerombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about $2\frac{1}{2}$ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed Block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roods distant, bounded north-westwards by a line about 1,350 roods in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roods in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly

known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary line of the Penhalonga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I,
residing at
in the district of in the
..... Colony, do solemnly and sincerely
declare that the animals enumerated below are free from any contagious
disease, including scab, and have not been in contact with any infected
animals within six months from date hereof, and that to the best of my
knowledge and belief such animals in travelling to* Station
will not come in contact with any animals amongst which scab or any
other contagious disease has existed during that period; further, that
such animals were thoroughly disinfected by dipping on.....
and will enter Southern Rhodesia within ten days of having been
dipped.

And I make this solemn declaration conscientiously believing the same
to be true.

Declared to at on this day
of before me.

Resident Magistrate, Government Veterin-
ary Surgeon, Scab Inspector, or Police Officer
of district from which animals are being
sent.

Number and general description of animals being sent

Owner's name and Address

Place in Southern Rhodesia to which animals are being sent

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION I, GOVERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including scab, and to the best of my knowledge and belief have not been in contact with any infected animals nor come from, or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date.....

Place.....

.....
Signature of Government Veterinary Surgeon.

Number and general description of animals.....Pigs,Sheep,
.....Goats.

Place from which animals are to be sent.....

Owner's Name and Address.....

Place in Southern Rhodesia to which it is desired to send the animals
.....

No. 110 of 1908.]

[16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
- (2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
- (4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.
- (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcasses thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.

- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.
2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—
- (1) Importation shall be through and direct from the Coast Ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
 - (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.
3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.
4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
 2. Number and Class of cattle to be imported.....
 3. Area or Farm and District where Cattle are at present located.....
 4. Area or Farm and District to which Cattle are to be moved.....
- Applicant's Signature.....
- Date
- Application
- Permit No.

ANNEXURE "B."

I,.....
 residing on the farm
 in.....do solemnly and sincerely
 declare that the..... (number in
 writing) animals also enumerated below have been in my possession since
 birth, and that lung-sickness, pleuro-pneumonia or other contagious or
 infectious disease has not existed amongst any of my cattle, nor on my farm,
 nor among any cattle with which these animals have been in contact within
 the last four years, and that these animals have never been exposed for sale
 in any public market or stock fair, nor been in contact with strange cattle,
 and that to the best of my knowledge and belief such cattle in travelling to
Station (i.e., station where cattle are to be
 trucked) will not come into contact with any animals amongst which lung-
 sickness or any other contagious or infectious disease has existed during that
 period.

Number of Animals.....Bulls.....Heifers.....
Breed.....

Seller's Name and Address.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent
.....

And I make this solemn declaration conscientiously believing the same to be true.
.....

Declared to at.....on this.....

day of.....before me,

Resident Magistrate for the district of
.....

No. 60 of 1909.]

1st April 1909

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal Government Notice No. 124 of 1908, and do hereby declare and make known that, notwithstanding anything to the contrary elsewhere provided, the importation of cattle for bona fide slaughter purposes may be permitted into the Umtali district from the adjoining Portuguese territory, under the following terms and conditions:—

- (1) The importation and disposal of cattle, introduced in terms of these regulations, shall be under the absolute control and direction of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.
- (2) The importation shall be by rail only, and all cattle shall be de-trucked at the slaughter enclosure and immediately confined therein.
- (3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."
- (4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.
- (5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.
- (6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.

- (7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

No. 211 of 1910]

[4th August, 1910.

IMPORTATION OF CATTLE FROM NORTH-WESTERN
RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

- (a) the districts from which they come and through which they pass are free from contagious diseases of animals;
- (b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for.

ANNEXURE "A."

Certificates under Section 3.

(a) I certify that I have examined the following cattle belonging to Mr.

.....cows and heifers,
.....calves,
.....oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....
Government Veterinary Surgeon.

(h) I hereby certify that I have examined the following animals belonging to Mr.....

.....cows and heifers,
calves,
oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....

Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

No. 223 of 1910.]

[18th August, 1910.

IMPORTATION OF ANIMALS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of animals and dogs from the following countries:—

Persia
 British Burmah
 Assam
 China and bordering countries, including Korea
 French Indo-China
 Dutch East Indies
 Hong Kong
 Federal Malay States
 The Philippines
 Zanzibar

and all other countries where surra is known to exist.

No. 79 of 1910]

[7th April, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby direct that all cattle found within an area of twenty miles of the Crocodile River, in the native districts of Tuli and Chibi, in contravention of the provisions of Government Notice No. 47 of the 10th March, 1910, shall be forthwith destroyed.

No. 254 of 1910.]

[22nd September, 1910.

SOUTHERN BOUNDARY.

UNDER and by virtues of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

1. All cattle within an area of twenty miles from Shashi and Ramaquabane Rivers in the native districts of Tuli-Manzamyama and Bulalima-Mangwe, save and except westwards of the south-eastern boundary of the Mphoeng's reserve, shall, within one month from date hereof, be removed therefrom by the owners to such place or places as shall have been approved by the Native Commissioners of the said native districts respectively.

2. The introduction of all cattle into the aforesaid area is prohibited.

3. Any person refusing or neglecting to remove cattle from the area, as herein provided or introducing cattle into such area, shall be liable to the penalties provided by the aforesaid Ordinance, and all cattle found in the said area in contravention of this Notice shall forthwith be destroyed.

No. 51 of 1911.]

[16th February, 1911.]

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section 1 of the Regulations published under Government Notice No. 254 of 1910, by omitting the words "an area of twenty miles from the Shashi and Ramquabene Rivers," and substituting the words "an area bounded by a line from the junction of the Shashi and Shashani Rivers and continuing up the former river, following the borders of the Territory to the most southern beacon of Mphoeng's Extension Reserve, thence along the eastern boundary of the Reserve to a point shortly south of the south-west beacon of the farm "Lewisdale," thence south-easterly and easterly along a demarcated line to the junction of the Bulawayo-Macloutsis road and Bulawayo-Tuli old road, and thence along the latter to the Shashani River and down this river to the starting point."

No. 391 of 1908]

[17th December, 1908]

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdraw the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

- (a) For every separate registration of a brand, 5s.
- (b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on ~~the~~ part of such animal next in order, according to the following table:—

- i. Off Neck or Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

- i. Off Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

- i. On Near Side or Ribs;
- ii. Near Rump (or Thigh);
- iii. Off Shoulder;
- iv. Off Side or Ribs;
- v. Off Rump (or Thigh).

(d) In the case of ostriches:—

- i. On Near Thigh;
- ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette."

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

No. 45 of 1909]

[13th March, 1909

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 223. of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing

symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcases of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

No. 336 of 1911]

RABIES.

[26th October, 1911]

THE following instructions regarding the treatment of persons bitten by rabid animals are published for general information.

In every case where a person has been bitten by a dog or other animal known, or suspected, to be rabid the following precautions are recommended:

- (1) The wound should be immediately and thoroughly cauterized. This, if it does not altogether prevent the disease, delays its onset sufficiently for Pasteur treatment to be successfully applied.
- (2) The patient should be sent to Salisbury for treatment at once. Delays are dangerous.
- (3) The fullest information should be sent to the Health Department as to date when bitten, locality, fate of dog, and especially reasons for supposing the dog to be mad.

No. 363 of 1911]

[30th November, 1911

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provision of section II of Government Notice No. 45 of 1909 to be in force in the native district of Victoria for a period of three months from the 11th of November, 1911.

No. 365 of 1911]

[30th November, 1911

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of clause II of Government Notice No. 45 of 1909 to be in force over an area within a radius of 15 miles of the Shamrock Mine, situated in the Gwelo district, for a period of six weeks from date of this notice.

No. 385 of 1911.]

[21st December, 1911.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of clause II of Government Notice No. 45 of 1909 to be in force in the native district of Mrewa for a period of six weeks from date hereof.

No. 386 of 1911.]

[21st December, 1911.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of clause II of Government Notice No. 45 of 1909 to be in force in that portion of Insiza native district lying south of the railway for a period of six weeks from date hereof.

No. 389 of 1911.]

[28th December, 1911

SLAUGHTER AREA, VICTORIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the area in Schedule "B" of Government Notice No. 295 of 1908, set apart for depasturing and quarantining of animals for slaughter at Victoria.

No. 240 of 1910.]

[1st September, 1910.

INSECT PESTS.

UNDER and by virtue of the powers vested in me by the "Nurseries Ordinance, 1909," I hereby proclaim the undermentioned insects to be pests within the meaning of the said Ordinance:—

- The Red Scale (*Chrysomphalus aurantii*)
- The Oleander Scale (*C. hederæ*)
- The Circular Purple Scale (*C. aonidum*)
- Ross's Black Scale (*C. rossi*)
- The Purple or Mussel Scale (*Lepidosaphes beekii*)
- The Long Scale (*L. gloverii*)
- The White Peach Scale (*Aulacaspis pentagona*)
- Woolly Aphis or American Blight (*Schizoneura lanigera*).

No. 309 of 1909]

[30th December, 1909

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from overseas, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expense of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

No. 306 of 1911.]

[5th October, 1911.

IMPORTATION OF PLANTS, Etc., REGULATIONS.

WHEREAS the insect pest known as San Jose or pernicious scale (*Aspidiotus perniciosus*, Comstock) has been discovered infesting nursery stock, fruit trees and other plants in the Transvaal Province of the Union of South Africa.

Now, therefore, under and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that, from and after this date and until further notice, the introduction into Southern Rhodesia of any plant or plants, not being fruit, seeds, bulbs, cut flowers, vegetables or vegetable transplants, grown in the Transvaal Province of the Union of South Africa is prohibited unless special permission in respect to each consignment be first obtained from the Director of Agriculture, Salisbury, Southern Rhodesia.

No. 249 of 1908]

[27th August, 1908

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

Department of Posts and Telegraphs,

Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of :—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.

ADVERTISEMENTS.

RUBBER TREES

Ceará : 1s. to 1s. 6d. ; Seeds : 2s. 6d. per lb., post free.
Cash with order.

C. F. M. SWYNNERTON, Melsetter.

MESSRS. MACLAURIN BROS.

(Breeders of Pedigree Friesland Cattle.)

Orders are being booked for young pure-bred Friesland Bulls bred by pedigree sire and dam.

These Bulls are bred and reared on the Farm Pomona near Salisbury, a Redwater area, and thus farmers may obtain highly bred animals without the usual risks attending importation and immunising.

Particulars of pedigree and prices will be obtained on application to Messrs. Maclaurin Bros., Salisbury.

FOR SALE.

Half-bred Angora Goat Rams. For full particulars

Apply HUGH BISSET,

Rocklands, Marandellas

SITUATION WANTED.

Position wanted on farm in Rhodesia as manager or working overseer. Age 21. Two years at Elsenburg Agricultural College. One year's experience on Free State farm of cattle, dairying, horses and grain. Good references. Free end of March.

R. T. Scott, Rivenhill, Ficksburg, O.F.S.

FOR SALE

Half-bred Bull Calves, by Hereford bulls ex-Colonial cows of Afrikander type ; bred in the Bulawayo district on Redwater veld.—Apply : C. S. Jobling, Devonby, Bulawayo.

ADVERTISEMENTS.

Government Stock Farm, Gwebi.

A limited number of Pure Bred Merino Rams, locally bred, are offered for sale, price £4 each. Apply to the Director of Agriculture, Salisbury.

DEVON CATTLE.

RED POLL CATTLE.

Bulls, Cows and Heifers always for sale.

LARGE YORKSHIRE PIGS.

AMERICAN BRONZE TURKEYS.

EXHIBITION AND UTILITY POULTRY.

Eggs for setting, 6/- per doz. (except Danish Brown
Leghorns 12/6)

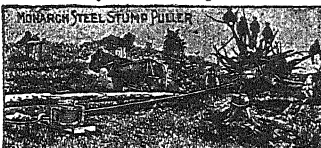
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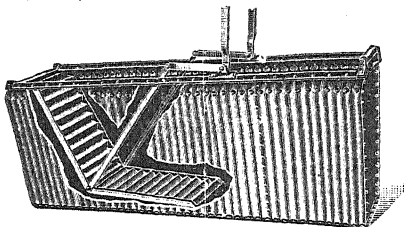
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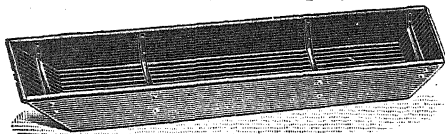
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THE RHODESIA AGRICULTURAL JOURNAL.

*Edited by the Director of Agriculture
assisted by the Staff of the Agricultural Department.*

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Editorial.

Correspondence on subjects affecting the farming industry of Southern Rhodesia is invited. Enquiries will be replied to direct, or through the medium of the JOURNAL. An interchange of ideas and suggestions between farmers will be particularly welcomed. Contributions of a suitable nature for insertion in this JOURNAL will be much appreciated. All communications regarding these matters, and advertisements, should be addressed to the Editor, Department of Agriculture, Salisbury.

THE TOBACCO CROP.—The marked success of the third annual sale of tobacco in the warehouses at Salisbury, has conclusively proved the possibilities of tobacco in Rhodesia. The immediate consequence is an increased attention to this crop, and a desire on the part of a number of farmers, and others, to partake of this golden harvest. The sale has demonstrated the fact that with this crop, more conspicuously perhaps than with any other, knowledge and skill are generously rewarded, whilst ignorance or laziness lead to low prices. The entry of many novices into the field is bound to lead to much inferior leaf being placed on the market, with a corresponding fall in the average rate, even whilst the best lots gain big prices. It behoves all tyros to endeavour to learn beforehand as much as possible of the cultivation and care of the crop, and more especially of the art of curing leaf in flue-barns.

The present supply of Rhodesian grown tobacco is by no means equal to our local demand and much more would have readily been bought had it been forthcoming. The South African public has undoubtedly acquired the taste for our tobacco and Rhodesian brands are popular and in demand and likely to continue so to be. The oversea palate has yet to be educated but that is not a pressing matter, although it is of interest to know that Rhodesian manufactured tobacco is already being successfully introduced in the Australian market.

The views of experts and the discussion which took place at the annual general meeting of the Tobacco Planters' Association are given at length in this Journal.

ANIMAL INDUSTRIES—The services have been secured of an officer to take especial charge of that branch of the activities of the Department of Agriculture known to Americans as Live Stock Husbandry or Animal Industry. Mr. R. C. Simmons is already well-known in Rhodesia, having been for several years connected with Land Settlement work. He possesses therefore the advantage of a good knowledge of this territory and of the rest of South Africa, as well as of the subjects with which he will especially deal. The treatment and prevention of diseases in livestock, and all that appertains thereto is the particular charge of the Veterinary Department, but there is also much done through Government channels for the encouragement and assistance of the breeding, raising and marketing of stock of every description—cattle, sheep, pigs and poultry. This work has of late grown to such dimensions that a specialist in that subject alone is required. Mr. Simmons' early training fits him for these duties and he first came to South Africa as a dairy expert to Elsenburg Agricultural School. Owing to the attention recently paid to pig-rearing and bacon-curing, Mr. Simmons is, on behalf of the Administration, visiting Denmark and the South of Ireland before entering upon his work here, to study the practical working of bacon factories in the countries where these have attained their highest development.

APPOINTMENT OF ASSISTANT AGRICULTURIST.—Mr. J. A. T. Walters, B.A., has been appointed Assistant Agriculturist *vice* Mr. Bruce Dickson, resigned. Mr. Walters has

had considerable South African experience, and for some years occupied the position of Assistant Botanist in the Transvaal Agricultural Department. The knowledge of South African agriculture which he possesses will serve him in good stead in this country, and we have no doubt his services will be of benefit to farmers. Mr. Walters has lately been engaged principally upon plant breeding with maize and other cereal crops.

ANAPLASMOSIS.—Attention is called to two articles in this issue from the pen of Mr. Bevan, Government Veterinary Bacteriologist, on the subject of redwater and gall sickness in cattle and in sheep, the latter a discovery of exceptional interest. It has not previously been known that sheep were subject to a disease of this nature, and the fact, besides being a somewhat startling one, furnishes yet another argument in favour of dipping and tick eradication, not from cattle only, but from all forms of farm stock.

EPHEMERAL FEVER OF CATTLE. — The re-appearance after an interval of years of that curious transitory and seldom fatal ailment of cattle known indifferently as three day sickness, stiff sickness or ephemeral fever is a circumstance of interest and moment, although fortunately it is not very serious in its effects. The subject is dealt with in an article by Mr. Bevan, M.R.C.V.S.

CONTRIBUTIONS.—Amongst the topics dealt with in this number we would bring to notice that of the Rev. Father Goetz, S. J., on "Rainfall in relation to Dry Farming" and a practical application of the same subject, on the cultivation in Rhodesia of winter cereals without irrigation, by Mr. H. G. Mundy, both being papers read before the recent Dry Farming Congress held in Pretoria.

A lecture delivered by the Agriculturist and Botanist before the Hartley Farmers' Association dealing with the possibilities of a number of crops other than the staples usually grown, is published for general information.

The subject of pruning of fruit trees, a matter too apt to be neglected, and the importance of which is often realised only years too late, is dealt with in an able and practical manner by Mr. Hermon Brown, Curator of the Municipal Gardens, Salisbury.

The valued contributions on Apiculture, and on Poultry, are continued.

PRIZES.—Attention is called to a notification made elsewhere in this issue of prizes offered for collections of insects to be exhibited at the forthcoming agricultural shows. It is hoped by this means to awaken an interest in the subject and to call attention to the great importance of dealing with these enemies of our crops, the extent of whose depredations is seldom sufficiently realised. It is also possible that by this means new pests may be brought to light.

This is a competition in which old and young can alike join and it is hoped that it may lead to good results.

LIME DEPOSITS IN RHODESIA.—In regard to the article on "Lime Deposits in Rhodesia," which appeared in the last issue of this Journal, the Government Agricultural Chemist desires to point out that the reports upon samples examined in the Government Laboratory from various parts of the country and quoted in the article, naturally only apply to the actual deposits from which the samples were taken. The analyses were given to show that among the lime deposits occurring in this territory there are many which are capable of producing first-class limes for cyaniding and building purposes, but the article is not to be regarded as a complete survey of the lime formations of the country as a whole or even of any particular district.

Among the Rhodesian limestones referred to was one (Laboratory No. 8) occurring at the Sinoia Caves, of which the magnesia content was too high for ordinary building, cyaniding and agricultural purposes. The remarks made on this limestone do not refer in any way to the deposit worked by Messrs. Bradfield and Crawford of the Sinoia Lime Works, Lomagundi. The lime worked by Messrs. Bradfield and Crawford is a travertine (vlei lime) situated about nine miles distant from the Caves; analyses made of the deposit show that it is low in magnesia and very similar in composition to vlei limes of the Mazoe Valley to which attention is drawn in the article.

In the table which gives the average composition of nine samples of Mazoe vlei lime, a small correction is necessary. As printed it would appear that these limes contain no iron oxide and alumina; they all, however, contain small amounts of these ingredients, 4.79 being the average percentage of silica and refractory silicates *plus* iron oxide and alumina contained in the nine samples.

A CORRECTION.—At page 367, lines 32 to 34 of the February issue of the AGRICULTURAL JOURNAL, it was stated that 2½ bags of Algerian Oats, sown at the end of February, at Mr. Ferguson's farm, Somabula Flats, yielded 1,500 lbs. of Oat Hay. This should have read that 10,000 lbs. of Oat Hay were reaped.

Rainfall in Relation to Dry Farming.

By the Rev. E. GOETZ, S.J.

(Director of the Bulawayo Observatory).

*A Paper read at the Dry Farming Congress, Pretoria,
November, 1911.*

(Continued from February number.)

The two principal processes advocated by American Dry Farming experts, for increasing and conserving the moisture in the soil without irrigation, are subsoiling with packing and surface mulching. The former from a soil moisture point of view, increases the water-holding capacity of the soil, by pulverising and packing the root layer of the plants.

Surface mulching, which consists in keeping a few inches of the top layer in a granular state, has two effects. First by rendering the top layer more porous, or rather by rendering the surface pores larger, it lessens considerably the run-off in the case of heavy showers. Its chief object, however, is to destroy the capillary pores and tubes, through which the soil moisture is brought under the active evaporating influences of the atmosphere. It is easy to see, when speaking with farmers, that they are often a little sceptical about the prompt desiccation of the soil through the capillary forces. Many, especially in the case of granite soils, attribute this mainly to the porosity of the granite soil. Without denying the possibility of a more rapid descent of the water in such soil I think that from the indications given by the wells and streams in many of the granite areas, one must conclude that it is to evaporation and not to percolation that the rapid desiccation of the subsoil is to be attributed. The height to which at ordinary temperatures water rises in capillary tubes depends entirely on the diameter of the tube. If the diameter is $\frac{4}{100,000}$ ths of an inch water will rise about 100 feet, if the diameter is $\frac{4}{100}$ ths of an inch the water rises one inch ; if the diameter is $\frac{4}{10}$ ths of an inch the water rises

about one-tenth of an inch. Now in compact soils the pores form the equivalent of continuous tubes which may be within the range of the foregoing figures. The American experts in what they call "Soil Surveys," have determined the number of particles of many loamy soils. In an ordinary loamy soil they find from two to four billion particles per cubic inch. It is easy to compute from this that the size of particles may be as low as $1/7,000$ to $1/8,000$ of an inch, and we may assume consequently that the pores are of the same order of magnitude. The theory of capillarity shows that in tubes of that diameter water will rise from seven to eight yards. Granite loam contains a sufficient proportion of clay to allow us to conclude, that it is well within the category of these loams, and that consequently even in granite loams the capillary forces are sufficient to account for the rapid desiccation of the subsoil to great depths. This upward movement of the lower moisture, though sometimes injurious owing to the accumulation of saline substances, may in a great many cases be beneficial, provided it be stopped before it comes into contact with the surface air. This is what is done by the surface mulching, which to the small pores of the soil substitutes pores of large dimension through which capillary ascent is insignificant. This mulch acts as a surface covering.

One point on which Mr. Campbell specially insists in his dry farming system is that the soil should be cultivated after every rain that has been heavy enough to puddle the surface, as long as vegetation allows it. This cultivation should be resorted to as soon as the implements can be passed over the ground without clogging. What I have said about the rapid evaporating from moist soil, especially in fine and warm weather, makes the necessity of this evident. Prof. King in his book on soil, makes a remark based on many experiments and observations, that if the ground has become so dry that rain falling on it goes only to increase the water film round the soil particles and does not start a downward percolation, capillary ascent of soil moisture from the lower layers is so certain that soon after such rain the deeper soil has become measurably drier than it was before, while the surface foot is found to contain more water than had fallen upon it. This, of course, will, in most cases, be an advantage, provided surface evaporation be checked as

soon as possible, which will no doubt be done if Mr. Campbell's advice about cultivation after the rain be followed.

Passing from theory to practice, we may ask ourselves what results have been obtained so far and whether this method of farming will pay. Mr. E. A. Hull, who is in charge of the experimental farm on Rhodes' Estate, in Matabeleland, told me that in the middle of last September he had a young orchard in full bloom. It had not been irrigated. Since the first week of May it had received no rain, and since the middle of March only one inch and a half. The ground had been ploughed deeply, and by constant cultivation a surface mulch of several inches had been kept in good condition all the time. When in the middle of September this mulch was raked off to test the soil below, it was found that below the mulch the ground was quite damp.

Practically all the experiments made to find the relation of crops to soil moisture show that the crops will be at their best if the moisture in the soil is kept within 40 and 80 per cent. of the soil's full capacity for water, that is, if the water percentage in weight be within 10 and 20 per cent. Below this limit the crops suffer considerably, and below 5 per cent. they are ruined. This, of course, is to be considered only as an indication of the action of moisture; other elements ought to be taken into account also.

In the conclusion of last year's report on the experiments carried out on Rhodes' estates in Rhodesia, I read: "The experiments carried out on Rhodes' farms have made it abundantly clear that good crops cannot be grown without thorough and frequent cultivation." After having pointed out that, among other advantages, this preserves the soil moisture, the writer, Mr. J. G. Macdonald, concludes: "That it pays to thoroughly till the soil is known nowadays to every farmer in the country, but many have not yet learnt that to this is due the difference, very frequently, between the yield of $2\frac{1}{2}$ and 7 to 8 bags of mealies per acre."

Among several instances of the great benefit derived from this surface cultivation which have been brought to my notice, I mention the following very striking one:—Mr. Ben Vincent, one of the most experienced farmers in Matabeleland, had a few years ago 900 acres planted in mealies. The

land was alluvial loam. It had been ploughed once, harrowed, planted, harrowed and weeded. The rainfall was 18 inches, and the crop five bags to the acre, which is about the average for Matabeleland. In a corner of the field he cultivated by way of experiment a plot of $5\frac{1}{2}$ acres in the following way. In the dry season he ploughed it about 12 inches deep. After it had received about six inches of rain he ploughed it again, harrowed and planted Boone County mealies, as in the rest of the field. He harrowed it three times till the plants were several inches high, after that he weeded it twice with the tooth cultivator; this was followed by a cultivation with the shovel cultivator, and when the mealies were in tassel he ridged it with the disk cultivator. On the whole, he estimates that the extra expense was about 50 p.c. per acre more than on the rest of the field. He harvested from this patch $115\frac{1}{2}$ bags of mealies, or 21 bags to the acre. The field had borne five crops already and had never been manured*

One great benefit derived from this frequent cultivation is that it minimises the disastrous effects of the droughts. We have very few reliable data in S. Africa from which we may get an exact idea of the harm done by the droughts. Farmers whom I have consulted on the subject tell me that in the case of mealies, the drought which is frequent in the middle of the growing season often reduces the crop by half, and this is borne out by the few reliable statistics I have. That this may be obviated by cultivation has been certified to me by farmers who have tried it. Mr. Ben Vincent gives me an instance of the effect of a single cultivation during a drought. He passed with a cultivator through his mealies during a dry spell. When he had done part of the field he stopped, considering that his crop was so injured that what he was doing was useless work. When the rain came some-time after he found that the plants in the cultivated part shot up at once, and finally gave a good crop, whilst those in the other part remained stunted and gave a poor crop. From his house one could see distinctly to the end of the season the line of demarcation between the cultivated part and the part he had left alone.

* It is to be noted that the rains were well distributed through the season and that there was no injurious break in the rains.

Mr. R. H. Fletcher three years ago, from mostly new land, got as a first crop eight bags of mealies per acre, which considering that the average in Matabeleland is from five to six bags, and that this was a first crop, he reckoned very satisfactory. He attributes his success to constant cultivation. This year from the same field with about the same rainfall he got only four bags to the acre. For various reasons he had been unable to attend to the cultivation, and the field had been treated in the old South African way. The crop was ruined by a spell of 3 weeks of rainless weather in the middle of the season, although this had been preceded by 2 weeks of heavy rains which had given $8\frac{1}{2}$ inches. A farmer in the same district mentioned to me that he tided his crop of mealies successfully over this same drought by frequent cultivation as soon as he saw the least sign of caking or cracking of the soil. In connection with these droughts it might perhaps be of use to dispel some partly erroneous ideas. Some farmers in the drier parts of the hinterland maintain that it is the intense heat and the dryness of the air that injures the plants. The heat and dryness of the air make plants shrivel up, even if they stand in water, as one put it to me. Plants are not injured by high temperatures such as we are. They can stand air temperatures up to 120; we seldom get even 100. As for the dryness of the air, they are not generally injured by it if the relative humidity remains above 10 per cent. Relative humidities below 10 per cent. for some hours in the day are not rare at the end of the dry season and at the beginning of the wet season, before the rains have well set in. But after that, even in the droughts during the wet season, they hardly, if ever, occur. What injures the plants is the intense transpiration which takes place from the leaves of the plants under the action of the sunshine which, in some of these droughts, is often nearly continuous during the whole time the sun is above the horizon. By a series of experiments made at the Montsouris Observatory, Beherain showed that in bright sunshine the leaves of wheat plants transpire from 70 to 93 per cent. of their own weight in water per hour, whilst in diffuse sunshine the percentage is only from 6 to 18 per hour, and in darkness from 1 to 2 per hour. Speaking of this transpiration of plants, Hondaille, in his "Météorologie Agricole," mentions that, when in full vegetation, a field of maize transpires in 10

hours (in sunshine) about $14\frac{1}{2}$ tons of water per acre. This is equivalent to '15 of an inch in 10 hours. If we apply this in the case just mentioned, where two weeks of a heavy rain giving $8\frac{1}{2}$ inches were followed by three weeks of drought with an average of 11 to 12 hours of sunshine per day, we see that the mealie field would have lost at least three inches of water by transpiration of the plants independently of the water which entered into the compositing of the plant. As the field had not been cultivated it was not clean, and the weeds and grasses consumed probably more than three inches, as the daily water consumption of an area of weeds and grasses is larger than the water consumption of an equal area planted in most of the ordinary cereals. As a part of the rain was lost from various causes, it is obviously due to the lack of sufficient cultivation that the benefit of such a heavy rainfall did not last over three weeks of drought.

I have mentioned before the extraordinary results that are reported from America in connection with dry farming. One cannot help being a little afraid that there is an element of land speculation mixed up with these reports. We read of nothing but wonderful crops and hear nothing of failures. If, however, we consult official documents which give the opinion of independent experts, who are more likely to give an unbiassed opinion, we find that, although they are more guarded in their utterances, they strongly urge upon the farmers of the West the necessity of treating their land according to methods now advocated by the so-called dry farming. They warn prospective settlers that those record crops they hear or read of are not likely to be a yearly occurrence; that from the nature of things farming in dry lands is not likely, at least for every kind of crop, to be as profitable as farming in humid lands; that where irrigation is possible, farming with irrigation is bound to be more satisfactory than dry farming, a statement emphasized by the fact that at the present moment the American Government are spending 50,000,000 dollars in irrigating works in the drylands of the West. But, with these words of caution, they fully recognise that these new methods have revolutionised farming in Western America.

Great use has been made for this paper of the following publications:—Cleveland Abbé: Report on the Relations between Climate and Crops (U.S. Weather Bureau, Bulletin 342, 1901). H. W. Campbell: Soil Culture Manual, 1905.

Utility Poultry Keeping for Amateurs and Beginners.

By "GALLINULE."

(Continued from December Number.)

To obtain a rough and approximately correct classification of those breeds of domestic poultry, which are bred nowadays for use rather than ornament, we may divide the race into five great families:—(1) the Asiatics, (2) the Mediterranean breeds, (3) the Hamburgs and their kin, (4) the native British breeds, and (5) the Polish or crested fowls. Beside these there are a number of recent breeds formed by crossing members of two or more of the older aristocratic families.

THE ASIATICS are nearly all huge table fowls, not at present remarkable for their laying powers, but highly valued for the quantity of meat they carry. The chief breeds are the Cochin, the Brahma and the Langshan. Of these the Cochin has degenerated into a purely ornamental fowl, though it was once a good layer and a quite passable table bird. Breeding on mistaken lines has ended in destroying every useful quality the breed once possessed, though even yet it enjoys a strange reserve of power, which makes it a useful cross in the hands of an experienced breeder, and there is more than one modern breed, which owes something of its excellence to the Cochin element in its blood. Apart from the Cochin ancestry of several of our present favourites, the breed has no interest for a beginner who wishes to confine himself to utility as distinct from exhibition breeding.

THE BRAHMA.—The Brahma, originally an Indian fowl from the low lands of Bengal, is the Goliath of the kind. It was once a fairly prolific layer, but, having been bred for many years principally for size, the laying has fallen off and

it may now be described as a poor egg producer. Taking size and beauty as our standards, the fowl is hard to beat. Even cockerels are expected to scale at least nine pounds, and pullets fully seven, while adult cocks and hens sometimes reach enormous weights. Its outward appearance is greatly in favour of the bird. Its massive breadth and lordly carriage impress one with a sense of invincible strength and great reserve of power, while the motherly, comfortable, well-to-do look of a good hen make her a favourite at once. Two varieties of the Brahma are bred, the dark and the light. In the former breed the hens are grey with black pencilling, the cocks have white hackle and saddlefeathers centred with black, while the rest of the body is of a lustrous green black of great beauty. The light variety has a tinge of Cochins blood and is mainly white in body feathering, while the hackles, tails and leg feathers have green-black markings. Both varieties possess the small, peculiar, knobby comb of the breed and show large development of leg feathering. All tendency to undue fluff is to be avoided in the breed, the plumage of which should be close fitting, or at least as close as possibly can be had. The head is a point of some importance. This should be broad and furnished with a short strong beak. For the utility breeder the most important consideration is depth of breastbone; this should be carried horizontally and give good attachment to the pectoral muscles. The whole bird should be square and compact, without any tendency to weediness and though heavy and slow-moving, yet, for its size, alert and active. The American strains are mostly to be preferred to the British, as being closer feathered and more true to the earlier type.

As a table fowl the Brahma is quite satisfactory, even when pure bred, and when crossed with Dorking, a very superior bird for consumption and a by no means bad layer. The main value of the breed, however, is as a cross with the laying breeds to improve size, and as such it deserves to be more widely known and used. It produces with the Mediterranean breeds, cockerels which are readily saleable and pullets which are fairly good layers. Half-bred Brahma hens can either be crossed back to the Brahma or a Minorca cockerel put to them. Wyandottes which have Brahma blood already in their veins, do not make a satisfactory

laying cross with the ancestral breed. As a general rule the laying average of Brahmas is a little below 100 eggs per annum. Minorca crosses are usually fairly prolific.

The great excellence of the Brahma hen lies in her strong motherly instincts. She is a good and faithful sitter though too heavy for small eggs. But though she may break an egg occasionally, she rarely treads upon a chicken and her maternal solicitude and capacity as a forager on free range are things to be wondered at. She will almost feed herself and her brood wherever insect food is to be had, and her own hardy way of life, gives the chicks an excellent education. A Minorca chicken trained by a Brahma hen will find a cropfull where a Cochin chicken would starve.

In the capacity of foster mother she is invaluable to the farmer who desires to raise a large number of chicks, while touched up with a soupçon of Old English Game blood she is perfect as a wetnurse for chicks where weasels and hawks are found.

LANGSHANS as a breed have been somewhat displaced in popular favour by their own bastard offspring, the Black Orpington, but are well worthy of Rhodesian attention, for they lay well in autumn and winter when eggs are dearest and go broody in spring, when prices drop. They are large black fowls standing on very long legs, without, however, looking as gawky as most long legged birds do. The plumage shows a beautiful beetlegreen gloss, which is the main characteristic of the breed, while a peculiar pinkish shade between the toes marks off the breed from all other black fowls. Comb and wattles are of medium size, the former being single and upright. The legs are moderately feathered. American Langshans differ considerably from English birds being much shorter in the leg and with somewhat heavier leg feathering. As the birds belong to the heavy table type, the American shanks are much to be preferred, for they are less subject to leg weakness. In both American and English types close plumage is sought although the original Langshans were rather fluffy birds of a distinctly Cochin type. As sitters and mothers Langshan hens are excellent, and as foragers they are steadily improving. It is, however, to be borne in mind that they are much less active birds than they look and require some

watching to prevent them laying on too much fat. A maize diet in their case is totally inadmissible and they should be made to scratch for every grain they eat.

The last of the Asiatic family to call for notice is the Indian Game, or as some prefer to call it the Cornish Game. It is not of pure Asiatic blood, having been crossed with black-red English Game. It is valued as a table fowl for the fine flavour of its flesh and its large size. It is a rather poor layer of pinkish eggs which are small in proportion to the size of the fowl. This want of laying capability makes a strong reason for avoiding the bird. In Rhodesia purchasers do not pay for flavour, but for size and consequently the one excellence of the Indian Game, the pheasant-like flavour of its flesh, is at a discount which the sterility of the hens still further accentuates. As a cross it has some recommendations, for while imparting the delicate flavour of its meat and some measure of its breast qualities to its crossbred progeny it does not affect the laying of the pullets as much as one might expect. Some few years ago Indian crosses were all the rage and were boomed ecstatically by Mr. Tegetmeier and his followers. But despite the boom producers who kept careful records were soon convinced that this cross, though gastronomically a great success, was a decided economical mistake and consequently the Indian Game mania is now slowly but surely passing away. Where eggs are hardly marketable the drawbacks are not so great and the cross may still be recommended. One must not, however, forget that to obtain the best results one must cross upon the Game hen and not *vice versa* for, in breeding, size is mostly determined by the mother. A grave mistake is often made by farmers in attempting to produce a dual purpose bird by crossing an Indian Game cock upon hens of a laying breed. The increase of weight in this case is comparatively slight and the loss of laying power in the pullets is more than sufficient to absorb all the profits gained from the slight increase of weight in the cockerels. In one word it is better to keep a pure bred general purpose flock than to attempt to manufacture a paying mongrel. Neither the pure bred Indian Game nor game crosses are much favoured by professional English fatteners as they are a little slow to mature and do not put on flesh as rapidly as some other breeds besides requiring

rather more room than it is sometimes convenient to give them.

HAMBURGHES.—As its name indicates this breed is of Low German origin, but little authentic information on the subject is available. There are several varieties of Hamburgs all marked by the large rose comb of the breed with its long leader behind; but though all are exceedingly handsome birds and good layers the Black Hamburg is *the* egg layer par excellence. No breed has ever reached the laying records of the Hamburgs. If I remember rightly the greatest number recorded is a little over 260 for a year's output, but the breed's one drawback is lack of size both in body and egg, although the flavour of their eggs is more than usually excellent. A Hamburg cross is valuable for improving laying powers, but the half-bred birds are not always as handsome as they might be. The breed has always been a fancier's fowl, and beauty the sole aim in breeding, yet despite this it is far and away the most prolific breed known to-day, if we except the so-called DERBYSHIRE REDCAP, which is really a Hamburg too. This is a handsome spangled bird with an enormously broad rose comb of singular beauty. It is larger and lays a larger egg than other Hamburgs. Its laying is said to be phenomenal, exceeding the record of any variety. It was at a small show at Buxton, that I first made the acquaintance of the breed and had some conversation with its followers, which induced me to purchase a cockerel and two pullets. That was in '79 and long before the days of utility shows, but if there had been such things then I should have backed my two pullets against anything walking; for in six months they had laid 280 eggs between them and were still hard at it in the midst of an English winter. But luck changed. An ill-tempered bulldog decided the fate of one, and the other vanished—most likely down a tramp's throat. For some reason, to me unaccountable, the breed was unknown, practically at least, outside its own county, and I was unable to replace my stock. Of late years, however, as I understand, the variety has spread, but strange to say, is still in the hands of the fancier and not the utility man.

The writer's experience of Redcaps is therefore insufficient to permit him to vouch absolutely for the general super-

excellence of the variety; but the fact that it stands the cold of the Peak district and is much in favour with farmers in that bleak region, argue that it is both useful and hardy. As for beauty, no fowl that ever was hatched, except its cousin the spangled Hamburgh, is fit to hold a farthing dip to it. If any Rhodesian poultryman wishes to create a sensation at the next show, he cannot do better than import a pen of Redcaps. Their only fault is noisiness, for they cackle more often and more loudly than any other fowl.

Hamburghs are small birds weighing from four-and-a-half to five pounds. Redcaps are somewhat larger and reach to six pounds or over. They are non-sitters, but occasionally hatch a brood. Some strains even are fair sitters, but can never be relied upon. The chicks are small but hardy and require frequent feeding. Hamburghs do well in confinement if well supplied with green food and a small daily allowance of fresh meat in addition to their grain ration. They will not, however, stand a maize diet.

THE BRITISH BREEDS.—When a poultryman speaks of British fowls the chances are a dozen to one that he means the Dorking. This breed is so typically, aggressively British that I really cannot swallow the legend that traces its origin to birds introduced by the Romans when they occupied the island, although this view is borne out by the statements of L. Junius Moderatus Columella in his treatise "*De re rustica*." I would rather believe that the Romans looted a pen from Caractacus or robbed Boadicea's hen roost. However that be, and the authority of Columella is not to be despised; the bird has been in Great Britain for nearly 2,000 years. He was there when Hengist and Horsa got there, and he crowed defiance at William the Norman and his gang of robbers when he landed at Hastings. Solid, stout, robust and unfailingly industrious, placid tempered and dignified, he struts about on his short legs, as if he knew his worth. Handsome he undoubtedly is; but it is as a table bird that he excels, for despite his bulk his flesh is very delicate, and in flavour surpasses that of any breed. Dorking hens are good layers of large eggs, good sitters and mothers, but require a great deal of room. Free range is almost a necessity to them, and in confinement they are an utter failure. They cross well with all the Mediterranean breeds

and render even the dry flesh of the Minorca juicy. There are several varieties bred, of which the best is the Red Dorking, which many consider the parent stock. These birds are combed like the Mediterranean breeds, that is, the cock has a large, upright and well indented comb, while the hens' combs fall over to one side, hiding the face. White Dorkings, which are rose combed, perhaps from some long forgotten cross with the Hamburgh, are the best layers, but somewhat lighter in weight than the other varieties. All Dorkings have five toes on each foot. Weights, according to standard, must not fall below 9lbs. for hens and 12lbs. for cocks.

SUSSEX FOWLS are closely allied to the Dorking but have only four toes. They are much sought for the table and fatten well but are rather poor layers, though some strains are better in this respect. In weight they slightly exceed the Dorking. In purchasing Dorking and Sussex fowls the most important point is size. The back must be broad and flat across the wings and taper well off towards the tail; the breast must be broad and deep and the breast bone deep and long. Plumage should be close and the whole appearance of the fowl square, compact and blocky.

THE SCOTS GREY.—This is a big, rough, hardy, dual purpose breed much affected in Scotland. Beautiful it is not, but it lays well and cocks reach a weight of 10 lbs. and over. They are not non-sitters but cannot be trusted to hatch.

THE POLISH BREEDS.—These breeds originated, as their name indicates, somewhere in the great central plain of Europe. They all possess enormous crests and small combs of a decidedly fanciful shape. That they are distinct from all other races is shown by the peculiar formation of the upper bones of the skull, which has a bony protuberance or outgrowth shaped like the steam dome of a locomotive. The breed is well known in France, but is less common in England and America. In the British Isles it is found to be delicate and susceptible to cold and wet, but there is no reason why it should not do well in Rhodesia. It lays very large eggs and its flesh is exceedingly tender and juicy. It is one of the ancestors of the well-known Houdan.

RECENT BREEDS.—The art of the breeder is ever aiming at the production of new excellences, and every decade sees

at least the introduction of one new breed, which claims, almost a monopoly of every gallinaceous virtue. Some never get any farther than the yards of their originators, while others spread over the world in a very short time. It will only be necessary to treat of such established breeds as have undoubtedly come to stay. These are Plymouth Rocks Orpingtons, Wyandottes and Houdans.

PLYMOUTH ROCKS.—This bird is an American production dating from the early seventies. It is a big rough upstanding bird of the popular blue-barred colour, single combed and yellow-legged. In the United States it is extensively bred, although to some extent it is being displaced by the White Wyandotte. Very little is known of its ancestry with any certainty, though there is little doubt that the Asiatic element in its blood is due to the Cochin. All, however, agree that the barring is inherited from the fowl which is known in the United States as Dominique, itself probably a cross with the Black Java upon some white fowl. Even now they do not breed very true to colour. Rocks are a decidedly useful bird, laying fairly well, growing rapidly and attaining great sizes. It is, however, a voracious feeder, consuming about 50 per cent. more food than other breeds. To the farmer desirous of raising large numbers of table fowls and to those who practice artificial incubation it is highly to be recommended. In selection for utility purposes size is the chief point to be considered; if the birds are from a reliable source colour is of no moment to the utility man. Cocks should weigh not less than 10½ lbs. and adult hens at least 9lbs. At five months good Rock cockerels should scale 6 lbs. and at 8 months 8 lbs. and upwards. The breast should be long and deep, and the bodies broad and massive carried on fairly long shanks. The bearing of good Rock fowls is very upright, and the tail is carried exceedingly high, the higher the better.

BLACK ORPINGTONS.—The Black Orpington was originated in England by Mr. W. Cook between twenty and thirty years ago and caught on immediately. It is said to be a cross between Black Minorca and Plymouth Rock top-crossed with clean legged Langshans. To all intents the Black Orpington is five-eighths Asiatic and may be described as a

clean-legged Langshan on shorter shanks. Every remark already made as to the usefulness of Langshans applies to the Black Orpington and need not be repeated, although it is not quite so heavy as the pure parent stock.

BUFF ORPINGTONS.—This fowl was the centre of the greatest poultry controversy since the days of the Langshan polemic. But that is now ancient history. Mr. Cook averred that he *originated* the breed; his opponents asserted, that he merely bred a local variety called Lincolnshire Buffs to certain points. Of course the disputants were rude at times and behaved as poultry men frequently do: like a crowd of jealous chorus-girls. This, however, is certain, that large numbers of Lincolnshire Buffs have been dispersed throughout the world as Buff Orpingtons, and have been shown and won prizes as such. The birds nowadays shown are mixtures of Hamburg, Dorking and Cochin blood, and when carefully bred are good layers and fair table fowls. Being, however, extremely fluffy, they look bigger than they are and are falling out of favour with buyers. They require very rigid selection in breeding to keep up their laying powers, and in Rhodesia, have up to now, been anything but a success. In Natal the fowl is rather popular; but this is, perhaps, due to the presence in that Colony of a branch establishment of Messrs. Cook & Sons, who have a high reputation for the breed and push it a good deal.

Buff Orpington cockerels are expected to weigh 9 or 10 pounds, but require good feeding to bring them to that weight. In purchasing only cobby compact birds should be selected. They do not make a good cross and should never be introduced among farm mongrels with the idea of breeding up. Buff Orpington hens may be re-crossed to the Hamburg or Dorking ancestor, but never to the Cochin side; yet on the whole it is best to breed them pure. It is not a breed for the inexperienced.

WYANDOTTES.—These are handsome birds with yellow legs and rose combs, a favourite with fancier and utility man alike, and have to a large extent dethroned the Plymouth Rock from his pride of place in America. They are sitters, but some varieties, notably the white, are very excellent layers. The weight of these birds is not great, but the

young cockerels find a ready sale for the table. It is a comparatively recent introduction, having been only thirty years before the public. Their origin is held to be a Brahma-Polish cross, top-crossed with Hamburg. Of the many handsome varieties the white is the best known and most largely kept and bears a reputation as a layer second to none. Hamburgs exceed their record in numbers but not in weight. For hardiness they bear a fairly good reputation and they do well in confinement, though not as well as the Mediterranean breeds or the Hamburgs. With wide range no fowl ever bred can compare with them as money makers. In confinement they should be made to scratch for every mouthful or they are rather apt to get fat and lazy. Maize diet they will bear only in moderation and on wide range, but in confinement they suffer from it.

Breeding stock should be pure white. Never buy a bird or breed from a bird showing a yellow tinge however slight in plumage: it is a sure sign of tendency to liver trouble. Clear yellow legs are a *sine-qua-non* and any fowls showing signs of scaly legs should be removed from the breeding pen. You may cure them easily, but the tendency to harbour the scaly leg parasite is strongly hereditary. The breeding cocks should be cobby compact birds on medium shanks with backs as short as possible and tails carried fairly high. Hens should be long in the back and carry their tails Minorca fashion. Their wings should be carried clipped close to the body and they should stand wide.

HOUDANS.—This is the only one of the French breeds which is likely to pay under present Rhodesian conditions. It is a round comfortable looking fowl of Polish ancestry with plumage of mixed black and white, the black having a distinct beetle green lustre. The head is provided with an enormous crest, which just allows the small butterfly comb to be seen. The wattles are almost hidden by a luxurious growth of feathery whisker. The legs are pinky white with black mottlings. Its weight ranges from eight to ten pounds for cocks while hens are about two pounds lighter.

The Houdan is much esteemed in France for its white and juicy flesh, and it is largely used in England as a table

cross. It lays large eggs in good quantities, and averages of over 200 eggs per annum are reported. The chickens will not stand crowding, but the adult birds do fairly well in confinement, if well supplied with greenstuff.

And now having travelled over a large extent of the poultry world I shall end by remarking that every man must make his own choice, after duly weighing the pros. and cons. No two breeders live amidst exactly the same surroundings, no two pairs of eyes have exactly the same ideas of beauty. On some soils white fowls become a dirty buff, on others black plumage grows rusty. These are minor details but weigh heavy with the poultryman. Confinement and free range may limit choice; the ability to do well on a maize diet is often a recommendation; foraging capacity is valuable to some keepers; noise a damning effect to others. In short there are a thousand and one reasons which may influence a choice which once made must be adhered to. Choose your breed deliberately and stick to it. That is one of the main things necessary to success. A breeder cannot chop and change and still progress.

(To be continued.)

A Novel Remedy.

A correspondent to the *Gwelo Times*, gives the following remedy for saddle sores or sores caused by harness on mules and horses. The simplicity of the cure might look too cheap, but he considers the oil to be worth half-a-crown for a tablespoonful, for this purpose at any rate. All one has to do is to save the oil out of a tin of sardines, place in a bottle and cork tightly, adding more whenever a tin of sardines is opened. When rubbed on the sore it not only heals it, but hardens the skin. He has used the remedy on mules with bad chest sores, and by reversing the mules from side to side no work was delayed, and the sores healed healthy and well. It is useless to purchase olive oil and add salt, as it has no effect; it must be taken from the sardine tin, and applied as often as convenient. A bearer or buffer of very soft leather, on harness where chafing, is also a great assistance.

Notes on Bee Keeping.

By FREDERICK SWORDER.

(Continued from February number).

II.

To many Rhodesians it may be news for them to learn that a few years ago South African bee keepers formed themselves into a united body styled the South African Bee Keepers' Association, with its headquarters in Johannesburg. Its membership has steadily increased, for it now numbers over 250, which is decidedly encouraging.

The Association's aims and objects are:—

1.—The encouragement, improvement and advancement of bee culture in and throughout South Africa.

2.—To educate, assist and bring together Bee Keepers.

3.—To work for the humane and scientific treatment of the honey bee.

4.—To supply South African markets with honey produced within its borders.

The Association also assists its members in the disposal of their honey.

As an indication of its growth, it has recently seen its way to issue its own journal, under the name of *The South African Bee Keepers' Journal*. This new monthly publication, price 6d., should reach the homes of many Rhodesians, for much useful information relative to bee keeping as now carried on solely in South Africa is to be found within its 12 to 20 pages.

Another excellent step taken by the Association and which has been in use for some considerable time, is the Association's Honey Label, for it serves as a guarantee that the honey which is purchased is genuine, while any dishonesty or corrupt practices aimed at by any of its members can be quickly traced and the delinquent correspondingly dealt with.

Mr. A. J. Chesterfield, Box 3653, Johannesburg, is the energetic and capable secretary, and under his fostering care the Association is accomplishing genuine work.

Rhodesians anxious to start this industry on correct lines, or those already owning a few hives of bees and wishing to glean further particulars cannot do better than get into touch with Mr. Chesterfield.

In Rhodesia and also in the four provinces of the Union experts, whose mission it is to give advice free, have been appointed by the Association. District branches affiliated with the parent body have also been formed in the Provinces, and these are accomplishing very useful work by imparting knowledge to those anxious to learn the rudiments of bee keeping, besides those out of reach of the central committee.

In the December issue of the *South African Bee Keepers' Journal* it is stated that more than two tons of honey have been disposed of in Johannesburg alone during the month of October, while a still greater weight passed through the hands of the depôt last November; but what is so encouraging and should set Rhodesians seriously thinking is the fact that still larger supplies are urgently needed.

Salisbury wants honey, and at present is unable to obtain an adequate quantity, yet, when our Capital is overstocked, which is not likely to be the case for a few years, then Johannesburg will take all the honey we can send her.

Since the importation from oversea of honey has been stopped there has naturally sprung up an increasing demand for South African honey, yet this large continent cannot at present supply even her own wants, and it is looking a long

way ahead before we see any chance of her markets being glutted with this very useful commodity.

Possibly many Rhodesian farmers might argue that with the many details connected with their business they have no time to devote to bee keeping, which, as far as they know from hearsay, "does not pay." Once again there is a splendid market and with this fact staring them in the face, like every other branch of farming, provided it is carried out in a systematic way "it will pay." The labour entailed is by no means irksome, yet always interesting, for the bees do all the hard work by collecting the nectar in good districts; besides it is nature's gift and free to all mankind. Supposing for a start the sum of £4 is spent in procuring a good type of hive with the necessary appliances, the proceeds from this one hive alone should, with reasonable management, at a low estimate return from 25 lbs. to over 50 lbs. weight of honey, this selling at the nearest township at 2/- to 2/6 per 1 lb section. To those wanting a little ready cash is not this problem a sufficient inducement to make them anxious to commence in this neglected industry? If in doubt how to begin get into touch with someone competent to give advice and it is my candid opinion you will not regret it.

(To be continued.)

Farm Acreage.

The area of the average farm in the Transvaal is 5,000 acres; in the United States it is 163; in England 66; and in Belgium 14½. The smallest holdings are to be found in Japan. In a little book entitled "Outlines of Agriculture in Japan," issued by the State Agricultural Bureau, it is stated that seventy per cent. of the farmers are engaged in farming on an area of land of not more than 2.45 acres for each individual. It is significant that the yearly output of the Japanese rice fields is £60,000,000, or almost double the annual gold output of the Transvaal.

Tobacco Sale.

SOME HINTS AND SUGGESTIONS.

Optimism was the predominant feature of the 1912 Tobacco Sale held in Salisbury, and when one considers the remarkable strides the industry has made in the last few years, this feeling will appear well justified. The first auction sale of Rhodesian tobacco was held in 1909, and in the space of three years the amount of leaf offered for sale has increased from 100,000 pounds to close on half a million pounds, while the price realised is more than five times as much as that received at the initial sale. The sale brought to town farmers from all parts of the territory, and generally satisfaction was expressed at the prices realised, while on all sides great things were predicted for the future. Many farmers who had not tried this profitable crop expressed their intentions of growing on a more or less extensive scale, and it is probable that the next planting season will see a large addition to the ranks of tobacco growers. There is, however, much to be learnt, and beginners would be well advised to glean all the information they can in regard to the cultivation of the leaf before embarking on an extensive programme. In this connection we take the opportunity of again drawing attention to the fact that a tobacco expert is now attached to the Department of Agriculture, and that his services may, on application, be placed at the disposal of those seeking advice.

As will have been seen, the average price paid for last season's crop was below that of the previous year. There is, however, no need for disquietude on this account, for the late rains to a great extent were responsible for the large amount of dark leaf sent in, but in any case the price realised left quite a good margin of profit to the majority of growers. There is cause for congratulation in the fact that some of the leaf offered for sale this year was the finest yet auctioned, and better will be very difficult to produce in Rhodesia. Of this quality, of course, there was only a limited quantity, but

the result achieved should act as a distinct incentive to less successful growers. On the other hand, there was a good deal of inferior leaf. To quote Mr. Rice's opinion of the crop, half may be termed "medium to fine" and the other half "common to medium." At the American sales about 85 per cent. of the leaf is usually "good to fine," so it will be seen there is ample room for improvement in Rhodesia. Better results will doubtless be obtained with experience for lack of experience and carelessness are the main reasons for the production of low grade tobacco. The former is only a temporary handicap, while, in regard to the latter, growers are beginning to realise that any extra attention paid to the crop is amply repaid. There must be, however, more white supervision and there must be a greater exercise of intelligence.

Experience will teach a man to adapt himself to circumstances, which with this crop, vary from year to year. Conditions vary with locality, and curing treatment successfully applied to one crop may result in total failure if tried at a neighbouring farm. We may here mention that an endeavour will be made, when the curing season arrives, for the tobacco expert to visit beginners and give them the benefit of his experience.

There is some divergence of practice in regard to topping. Many farmers do not top until the bud flowers, but in cases where the soil is poor, and there is no danger of the tobacco getting too heavy, topping the bud before it flowers will have the effect of getting more weight into the leaf and also producing a better sized leaf.

There is one point to which growers do not appear to pay the attention it deserves and that is in regard to the hanging of the leaf in the barn. Many hang the leaf too thickly and also string it at uneven distances apart on the lath. In the former case the leaf does not have a fair chance to dry, while if the bunches are hung unevenly the current of air is unequally distributed. The bunches should not consist of more than three leaves, and the laths should be far enough above each other so that when the tobacco is hung there will be sufficient ventilation space between the tips of the stalks or leaves of the top tier and the leaves of the tier below, so that each bunch will get the same amount of ventilation.

A good deal of the tobacco received at the warehouse was very badly packed, some being too wet and some too dry. The senders of course paid the penalty by the greatly reduced prices realised for the leaf. If the leaf is too wet, until dried it is getting darker, and the value of course decreasing, while if too dry the leaves are brittle and a lot goes to scrap. About 50,000lbs., or nearly 12 per cent. of the tobacco sent to the warehouse last year, went to scrap and this percentage must be reduced. Some growers had practically no scrap while others had as much as 25 per cent.

Growers will be well advised to continue growing Virginia leaf, for which the supply is very much below the demand and is likely to be for some time. In this connection it is interesting to note that during the twelve months ended December, 1911, tobacco to the amount of £76,382 was imported into Southern Rhodesia, of which sum £17,071 came from oversea. During 1910, tobacco imports into this territory amounted to £60,318, of which £12,095 came from oversea. The Union of South Africa, during 1911, imported tobacco to the extent of £188,606, of which 932,737lbs. or £50,078 was unmanufactured. During 1911 the Union exported tobacco of all kinds amounting to £20,688.

There is a certain demand by South African buyers for good dark pipe tobacco, and an average of 1s. per pound was paid for such at the last sale. Messrs. Hermann & Canard purchased the majority of the pipe leaf for their Invicta Mixture.

As regards seeds, the varieties used here are Hester, Goldfinder, Hyco and Warne. Of these, the two last named are but little used, and are not suited to the soil. Hester and Goldfinder are generally favoured and there is little difference between the two. Hester produces a slightly richer leaf with more oil in it, but the Goldfinder seed grows a larger and thinner leaf more suited to cigarettes.

With regard to fertilisers, the tobacco experts consider the method of applying "Safco" in this country could be improved upon. Most growers wait until the plant is well out of the ground before applying the fertiliser which is then sprinkled round the plant. The plant should be planted in the fertiliser, about half the quantity now used being applied.

The roots are thus able to get hold of a small amount of plant food at once, which means a rapid growth within a day or two of transplanting, whereas with the present system the plant wilts and has to struggle for possibly three weeks or a month before it gets any direct assistance from the fertiliser. The other half of the fertiliser should be applied when the plant is about 12 inches out of the ground. Both Mr. Rice and Mr. Lewis strongly advocate planting on ridges and several planters have adopted this method with this season's crop. Mr. Lewis has seen several crops where part has been ridged and he states that the difference was at once noticeable, the ridged crop being far more advanced than that planted on the flat.

There is also ample room for improvement in regard to cultivation. The cultivator used in this country is not of the best, while this important branch of the culture is too apt to be scamped. Very few farmers cultivate up and down the rows, with the result that the weeds within about nine inches of the plants are not touched.

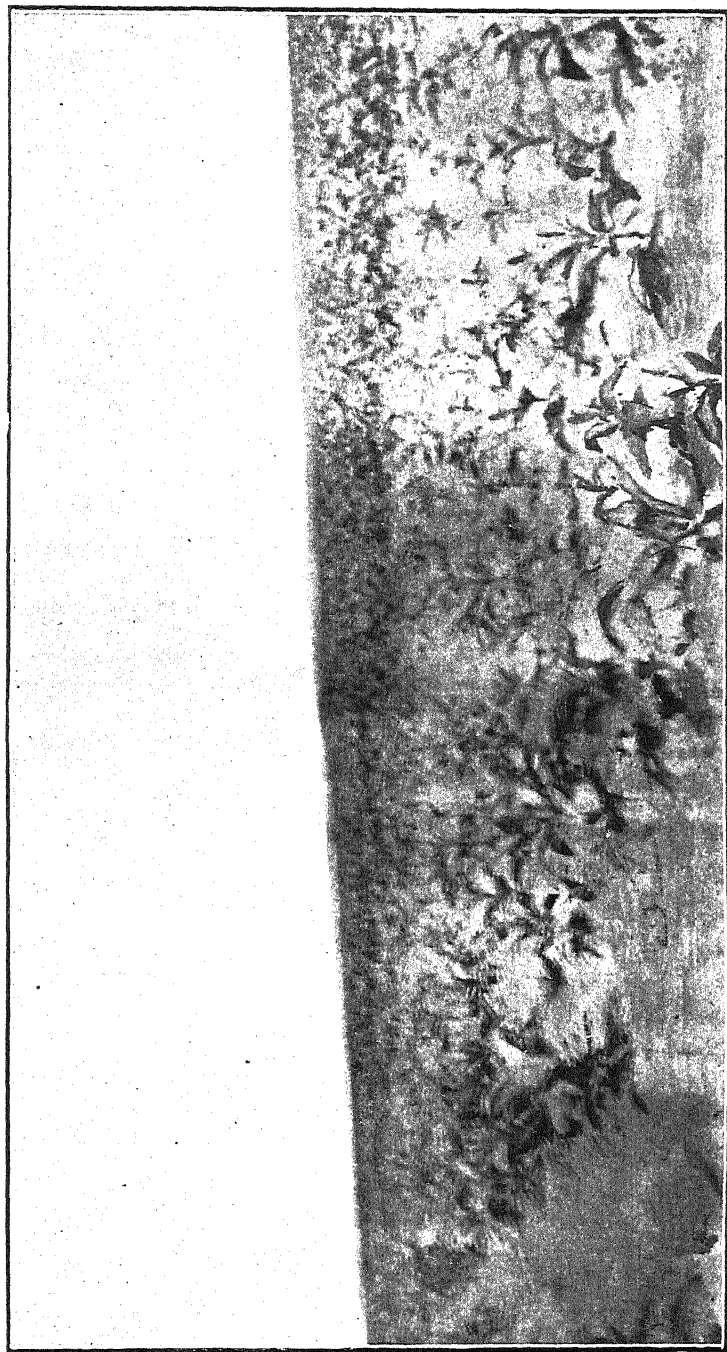
As regards crop rotation, from close observation, Mr. Rice is of opinion that tobacco should not be grown on the same land for more than two years in succession. Mr. Mundy, Agriculturist and Botanist, considers that it would be advantageous in the third year to put in a leguminous crop, such as cowpeas, kafir beans or monkey nuts. These will restore the fertility of the soil to a considerable extent, even though the entire crop is harvested, while the seed from the kafir bean or cowpea can be picked and the remainder of the crop ploughed under. It should be borne in mind, however, that in ploughing in a leguminous crop it is advisable to do this before the close of the rainy season, in order that the vine may be thoroughly rotted before the next planting season. To do this, seed should be sown early and the crop ploughed under about the middle of February or the beginning of March. A change crop, which would benefit to a considerable extent by the residual value of the fertiliser applied to the tobacco in the two previous years, can also be provided for. Under this heading might be taken haricot or Canadian wonder beans, chicory, potatoes, summer oats or Boer manna. The two former are readily marketable and return a good profit, while the latter, owing to the humous



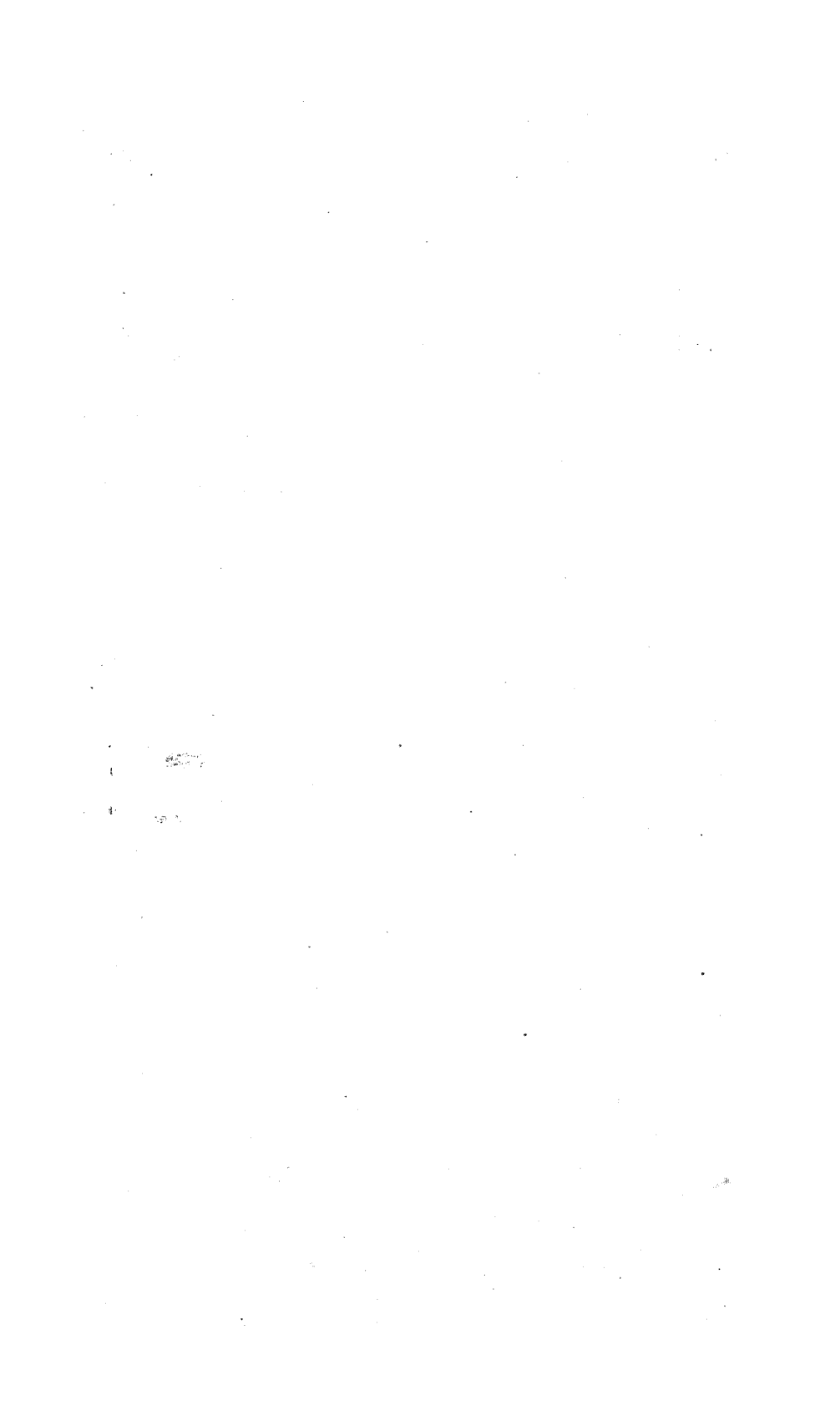
Tobacco at Uplands Estate (the Tobacco Company of Rhodesia and South Africa Ltd.), Marandellas.



Tobacco Curing Barns at Uplands Estate.



Tobacco at Sleamish. (Note stunted plants where fertiliser was not used.)



which will result from the stubble being ploughed under, will again assist in maintaining the soil in a good physical condition.

Altogether it can truly be said that the future of tobacco in Rhodesia is particularly hopeful, and it will probably not be long before this territory will occupy a prominent place in the tobacco growing countries of the world.

MEETING OF GROWERS.

The second annual general meeting of the Tobacco Planters Association was held at the Town House, Salisbury, on the 1st February, a large gathering of planters attending. Col. Raleigh Grey presided and the Marquis of Winchester, Mr. F. J. Newton, Dr. E. Nobbs, Mr. Moore, Resident Director of the Tobacco Company of Rhodesia and South Africa, were also present.

The Chairman in his opening address said:—

“I think we may congratulate ourselves that the tobacco industry has made excellent progress. The figures resulting from the annual sale, which has just been concluded, will demonstrate that progress more effectively than anything I can say. We must not, however, be led away into the belief that prices such as realised to-day will hold for all time. The time must inevitably come, in a prosperous industry of this kind, when the production of the commodity will exceed the demand, as far as the local markets are concerned. It will be necessary then to establish an export trade for the purpose of disposing of our excess crop, which will inevitably result in considerably lower prices than obtain to-day. We must, therefore, prepare for that time and endeavour to minimise, as far as possible, the effects of that position, and this will best be done by endeavouring to reduce the cost of production, and by improving the quality of the product.

The combination amongst the planters during the last two years, which was effected by your association, has been productive of the best results, and so long as the planters continue to sell their tobacco at a general auction sale, open to all comers, they will ensure fair competition for their wares and fair market prices. If the planters do not combine, but sell their product out of hand, the result must be disastrous to

the industry, for not only will individual growers obtain a considerably less price than they would obtain if their products were properly graded, treated and marketed, but it will also be found that the pick of the tobacco will be privately bought, thus taking away from the annual sale its most attractive feature, and leaving only a large quantity of inferior tobacco to be sold at comparatively low prices (applause). The only hope for the tobacco industry, especially in these years of its infancy, is for the planters to combine in every possible way they can (hear, hear). Owing to the representations made by the manufacturers, who do not approve of buying out of the warehouse of a competing company, the Association has endeavoured to arrange with the Government for the provision of an independent warehouse in which the product of the planters might be treated. Negotiations with the Government have been continued for a lengthy period, and your committee only this morning received definite information from the Administrator that the Government are unable to buy an independent warehouse as desired by us. His Honour was informed by a deputation of your committee, who were received by him, that it was the policy of the tobacco growers in this country to erect warehouses for the purposes of treating and marketing their product on the co-operative principle as soon as they are strong enough to do so, and that probably in the course of a very short time the tobacco industry would be able to take over the Government warehouse for this purpose. His Honour, however, informed the deputation that he did not consider such operations were within the scope of the duty of the Government, and that the tobacco growers, if they desired to combine for the purpose, must make their arrangements independent of the Government. His Honour suggested that the Land Bank, which is shortly to be formed, will be the proper institution for the Association to approach, as far as financial requirements are concerned. In view of the refusal of the Government to provide warehouses for the treatment of the product, your committee recommend that the growers of this country should continue to take advantage of the excellent management and liberal terms offered by the Rhodesia Tobacco Company, and it is right for me to say that the growers are satisfied with the arrangements hitherto made and the facilities given

to them by that company. In seeking to obtain an independent warehouse, growers have not been actuated by any feelings of dissatisfaction, but have endeavoured to meet a somewhat difficult position, and have acted in what they believe to be the best interests of the industry. The committee believe that it is in the interests of the growers and the buyers alike that the product of Rhodesia should be marketed at the annual auction sale. We regret that we are unable to meet the buyers' wishes by arranging for the establishment of an independent warehouse, and we can only say that we shall do this as soon as ever we are strong enough, and that in the meantime we can only hope for the continuance of the support hitherto afforded us by the tobacco manufacturers of South Africa at our annual sales. It must be apparent to growers and buyers alike that the only profitable system to adopt is to collect the bulk of our tobacco leaf for proper treatment and grading before it is offered for sale. This is clearly shown by the high prices obtained at last year's sale and at the sale just concluded, and no other method of disposing of our produce can give the same profitable return. Whilst, therefore, it is impossible to carry out the wishes of the growers and buyers, by establishing an independent warehouse at present, and whilst we believe that combination among the growers is necessary for the treatment and marketing of their product we assure the buyers of South Africa that we shall carefully consider any representations which from time to time they may desire to make, and meet those representations as far as possible. Certain suggestions from the buyers with reference to the branding of crops and rail facilities are now having the consideration of your committee. It is also intended considerably to strengthen this association and increase its utility. We welcome the presence of the buyers here to-day, and we trust that we shall receive from them, as well as from the members of our association, a full expression of opinion upon matters connected with our industry.

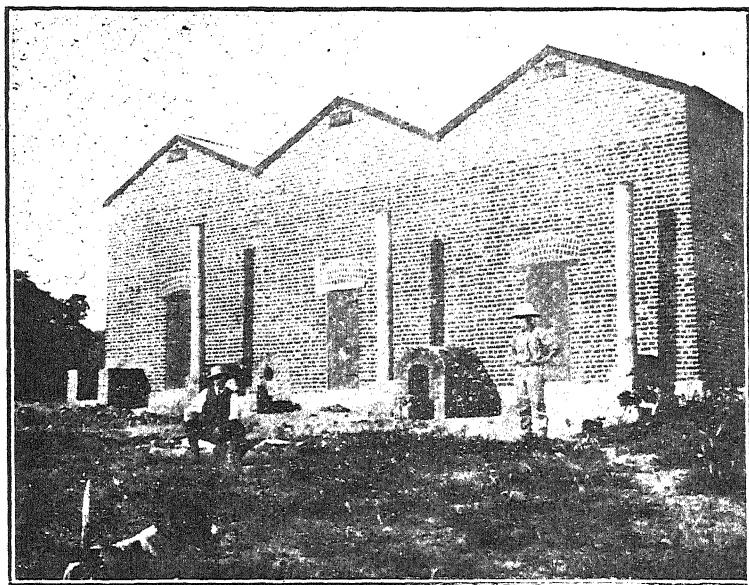
After certain formal business had been concluded, Mr. Garvin said he thought it was "up to" every member of the association to support the present organisation. As a society they were young, and they had not had the time to draft rules, but they need not get involved in any legal quibble. They were growing tobacco and they wanted to obtain a fair

price, and their only hope to get that was by co-operation. The previous year the members of the association, or a portion of the growers, signed an agreement not to sell outside the warehouse and the buyers agreed not to buy outside. He was willing to agree to that policy, and he thought that 95 per cent. of the growers were satisfied with the present prices realised by their tobacco and the way it had been handled by Mr. Rice during the last three or four years (applause). He thought it was the duty of every member of the association again to sign an agreement that day not to sell tobacco except through the medium of the warehouse. When he said that he thought he was voicing the sentiments of 90 per cent. of the growers in the country.

Dr. Sketchley said he would support the previous speaker.

Mr. Zimmerman asked Lord Winchester if the Rhodesia Tobacco Company were prepared to continue the past arrangement in regard to advancing money on the crops, charges in the warehouse and past facilities? And in view of the action taken by the buyers whether they would be prepared to extend those advantages? There were many men who were starting with not too much capital. If a man was offered cash down it would be a great temptation to the farmer to sell his tobacco to the buyers. That, however, could be met by the Rhodesian Tobacco Company extending the advantages which it had extended in the past.

Replying to questions, the Marquis of Winchester said: "I first wish to say how pleased I am to be here to-day and to meet such a large concourse of growers who are so interested in the tobacco industry, which I have always thought would be a great boon to the agriculturists in Rhodesia. Since the year 1907, when I came up here, I have always used my influence with the Company to support the tobacco industry in every possible way, not only because I thought it was an additional source of revenue to the big farmers but also because I thought it was an extremely good crop for the smaller man to grow. I have been asked certain questions, but before I answer them I want you to clearly understand that I am here as a director of the B.S.A. Company and not as a director of the Tobacco Company. But as the B.S.A. Company is largely interested financially in the success of the Tobacco Company, the Chairman of the Tobacco



Flue-curing Tobacco Barn, Borrowdale Estate.



Tobacco at Borrowdale Estate.—A promising Crop.

Company asked me especially to try and meet the farmers and personally assure them on his behalf that no sympathetic treatment which it was possible for the Tobacco Company to give, compatible with its business relations, would be lacking in the Company's treatment of the growers. Now, I think I may safely say from the general statements I have heard that there is not a single complaint in this room from anybody that the Tobacco Company in the past has not carried out the wishes and desires of the Chartered Company in every respect. With regard to the question of advances, I think I can safely say that the Tobacco Company will continue to do its best as it has done in the past, of course, provided that the Tobacco Company has some guarantee that the growers will support them and support their warehouse. As to the same charges for warehousing and everything being continued, I fancy that the warehouse, as at present run, is run at a considerable financial loss, even with the large supply of tobacco which has passed through its hands this year. Undoubtedly, that loss will be wiped out as we get a larger amount passing through the warehouse; but I believe that it is the intention of the Tobacco Company to increase slightly the warehouse charges in order not to make a deficit on the warehouse side of their business. Dr. Sketchley has asked me whether the Tobacco Company will increase its warehouse accommodation. That seems a very difficult question to answer. I should say that the Tobacco Company will first consider whether they are confident that the growers are going to support them. I do not think, gentlemen, that you have given them much support this afternoon when you discussed the question of an independent warehouse. Naturally, the Tobacco Company do not want to build a warehouse which is not going to be occupied. If you start your own co-operative warehouse it might be started even outside of Salisbury, or you might have two in different parts of the country, and the Tobacco Company would have its extended warehouse thrown upon its hands. If the growers will support the Company the Company will make the necessary arrangements as to warehouse accommodation, regarding any crop which the growers can bring to it. Another question which was asked by Mr. Garvin is as to the Land Bank.

I cannot pledge what the Land Bank will do because the manager is not yet appointed; but my own opinion is this: that the Land Bank will run its business quite independently of the Tobacco Company and if a good man comes along and wants a loan and says "I have so much tobacco now and so much under cultivation on my farm, can I have a loan?" I do not see why the Land Bank should not lend him the money in the same way as it does to everybody else.

I should think the Land Bank will do any business which will pay it to do if they have security. They are here for business and to assist the farming industry. I should think it will be as safe for them to lend money on that as on anything else. In fact it is better security than the security of some things.

After further discussion the Chairman said he thought the meeting had had a very satisfactory assurance from Lord Winchester and he thought they may take it that there was no doubt now that they knew that they could not look to the Government to put up an independent warehouse, but there was no doubt that they would be treated in the future as they had been treated in the past by the Rhodesia Tobacco Company. At all events they had no reason to think otherwise. They would have Mr. Inskipp back shortly and it would be the duty of the committee to interview him and to try and get the facilities referred to extended which he (the speaker) had no doubt that Mr. Inskipp would do, and also get any further facilities which the association might think it was advisable to obtain. He was very pleased to see the tobacco buyers of South Africa had attended the meeting. As he had already said, although they had been unable to obtain the independent warehouse which both the growers of Rhodesia and the buyers of South Africa thought was necessary to obtain, they could assure the buyers that they would always consider very carefully any representations which they might make to the association with a view to carrying on the industry in the best possible way. The best of feelings existed between the buyers and the growers and he saw no reason why those feelings should not continue to exist. He trusted also that the buyers would voice any point which they might wish to bring forward to the Association for the meeting would be glad to hear any remarks.

Mr. Asbury (United Tobacco Company) spoke as to the attitude of his company regarding a tobacco warehouse. He said that when his colleague, Mr. Hawley, was here last year, the matter was pretty well threshed out. Then too, when Lord Winchester was in Capetown, they put their case before him. He (the speaker) had come up to Salisbury with instructions that he was not to buy at the auction sale next year. Immediately his company's agreement expired, he would be glad to get into touch with the planters who cared to dispose of their 1912 crops. That was what his company intended to do. They would have to make their arrangements outside of the warehouse. His company also had under consideration the advisability of lending assistance to the farmers, but he did not understand how the company intended to do it. It had been suggested that the United Tobacco Company should support and help to finance an independent warehouse, providing the Chartered Company did not think it was worth their while to put up one. He thought it would be decided just what the company intended to do, in February, when they considered the question of buying out of hand. His Company was not prepared to pledge itself to support the warehouse. It might do so. (Laughter.)

Mr. Garvin said he did not think that the United Tobacco Company was treating them fairly. The growers had made a great effort to try and establish a warehouse, but the Government would not assist them. He did not think that any of the buyers were under a disadvantage by buying at the warehouse, or that they had paid a halfpenny a pound more than if they had bought at an independent warehouse. The farmers were not quite in a position to put up a warehouse, and he thought the United Tobacco Company were taking them at a great disadvantage by saying that they would withdraw from the present warehouse. He suggested that every member of the association should sign an agreement for the present year or the next year or two as the case might be best, not to sell his tobacco outside the warehouse.

Mr. Hermann said he would like to state that he had not mentioned that he would not attend the sale. He would still support the warehouse and come to the auction and buy. He would not pledge his firm under any consideration to

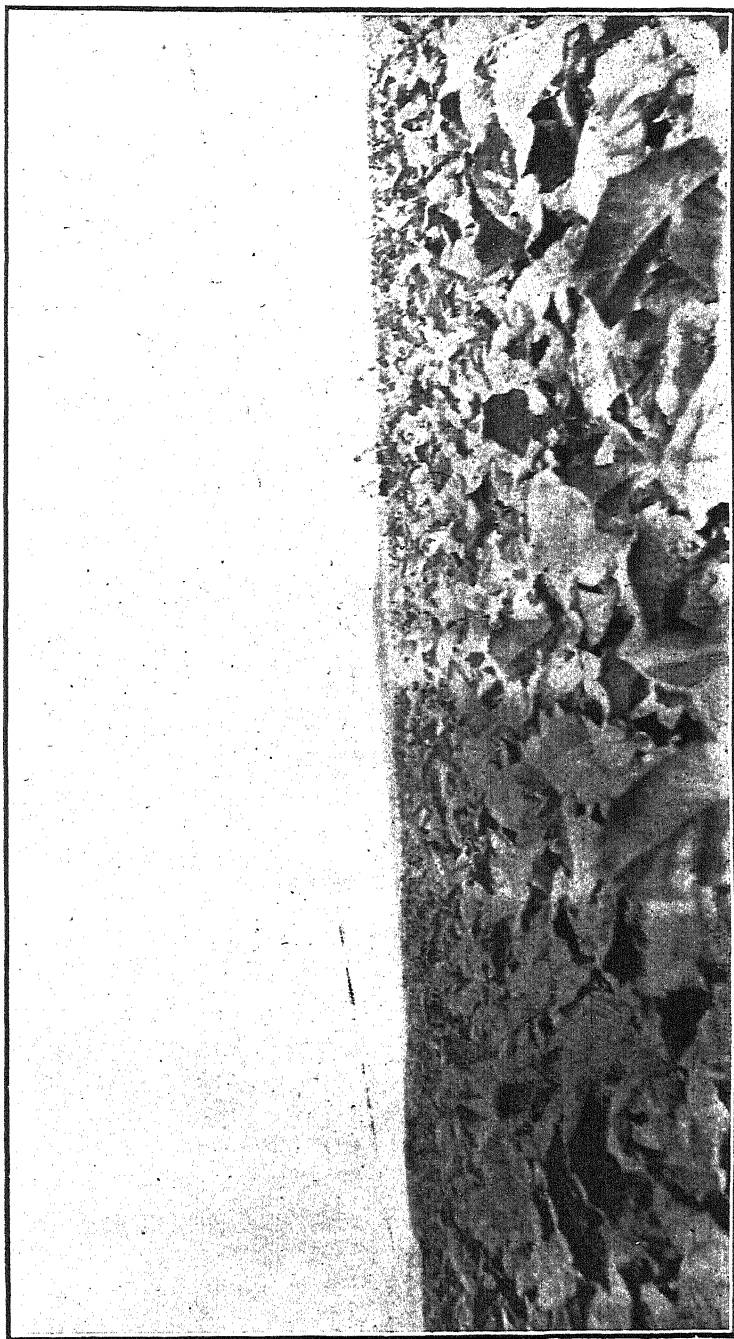
say that it would not buy at the auction. He might, however, use all the tobacco which he had bought at that day's sale within six months, and he might want more. If the company could undertake to supply him with his requirements he had no objection. That was the position which he took up.

Mr. Garvin moved :—

“That the members of this Planters' Association bind themselves by agreement not to sell their tobacco of the coming year's 1912 crop, except through the tobacco warehouse, by auction.”

Mr. Black seconded, after discussion.

Dr. Nobbs (Director of Agriculture) said he would like to offer a word of advice to the growers. Even the tobacco growers themselves would not care for the Government to step in at the present moment and compel all farmers to send their tobacco into the central warehouse. That would scarcely meet with the ideas of the Government at the present moment. He, however, urged every one of them to sign the agreement, and he urged them to do it for one practical and cogent reason. He had always heard that the law of supply and demand did not hold good so far as tobacco was concerned, but that the larger the supply of tobacco of one class the higher the price per pound. That was not true of any other commodity. At a central warehouse they had the grading of a large quantity of tobacco, and the buyer could say that he could buy so many thousands of pounds of leaf of one type, which would enable him to put on to the market pipe or cigarette leaf of one uniform quality, which was essential if the buyer wanted to put a brand on it. And to get that he must be assured of a large supply, and that supply must be good, not only for one year, but for all time. The manufacturers had evidently learned that Rhodesia offered a particular type of leaf for which there was a demand. Therefore, having put these brands on the market they were bound to come to Rhodesia. Those firms had to come to Rhodesia to get that particular flavoured leaf, and they could offer a much higher price if they got it in bulk. Obviously the sale such as they had gave the buyers the opportunity, and they were tempted to give far higher prices for what was gathered together at the sale, than what they could give for one grower's particular lot. In the latter event



Tobacco on the Farm of Mr. R. G. Garvin, Sleanish, Mazoe.



they could not see what other growers had, and they could not offer such high prices. It was to the growers' advantage to get the highest prices, and it was to their advantage to bring their tobacco to a sale such as that was, than if they tried to sell quite independently of each other.

The resolution was altered to read:—

“That all tobacco growers in Rhodesia of Virginian leaf bind themselves by agreement not to sell their crops for 1912, except through the tobacco warehouse, by auction.”

On a division 25 voted for the resolution and 4 against it, and it was declared to be carried.

Prickly Pear Feeding for Stock.

The *Queensland Times* thus refers to the carcase of a prime fat cow:—“Probably those who saw it would have been more surprised had they known that the animal, when alive, had lived on prickly pear land for six months without getting a drop of water. She was brought down from the Yuelba district with three other cows and twenty-two bullocks by Mr. W. A. Nason. They had been running on Mr. P. Minnage's Wallavilla Station for the preceding six months. There is no water on the station at present, but there is an abundance of prickly pear, on which the cattle had not only thrived, but also got into prime condition. The beast referred to—quite a heifer—was said to be a picture of condition before she was killed—fit for any show-ring. She certainly produced a splendid carcase of fat beef, weighing between 800 and 900 lbs. Mr. Nason, who has a long experience of the west, says, that when cattle are on prickly pear land they do better without water than with it. At Wallavilla, besides prickly pear, there are plenty of saltbush and cotton bush, and a fair supply of grass. Following on the above it is interesting to learn that the feeding of milch cows with prickly pears in Texas has given excellent results. They are cheap fodder, and cattle like them. To render the prickly varieies suitable for cattle food, the prickles are burnt off with special gasoline lamps, which can be done while the fruit is still on the plant. In this way also the number of plants from which the animals are to feed is limited.”

The Anaplasmoses of Cattle.

By LL. E. W. BEVAN, M.R.C.V.S., Government Veterinary Bacteriologist.

The term *Anaplasmosis* has recently been applied to certain diseases of cattle, with which the farmer has for a long time been familiar, but which have only lately been pronounced by Dr. Theiler to be due to a blood parasite, to which, by reason of its structure and position in the red-blood cell, he has given the name *Anaplasma marginale*.

Much that has been written on the subject is of such a highly technical nature as to be almost unintelligible to the ordinary farmer, and it is thought advisable to explain as simply as possible for our readers this subject, which is of considerable practical importance.

Those who have at any time imported cattle into this country from overseas, or from certain redwater-free areas of the Southern territories, and have submitted them to inoculation with blood from local animals, or have allowed them to "pick up" red-water from the veld, will remember that after a certain time the animals became sick with symptoms of red-water. Those which were fortunate enough to recover from this first attack, after a short time—a week or two—once more became sick. This second attack has been known as the second re-action and was, until recently, regarded as a relapse of red-water.

Now, it has been known for many years that the cause of red-water is a small animal parasite which invades the red-blood cells, and to this the name *Piroplasma bigeminum* has been given because the most characteristic appearance which it presents when seen under the microscope is that of two pear-shaped bodies lying side by side.

But while during the so-called second re-action it was often possible to detect these typically shaped parasites, it was remarked that they were accompanied by and often greatly

outnumbered by certain dark-staining spots or points situated at the margin or periphery of the red-blood-cell, and to these the name of *marginal points* was hitherto applied.

The association between these two forms was so frequent that the second type was generally looked upon merely as a variety of the first: it remained for Dr. Theiler to show that the two were separate entities, giving rise to distinct diseases. The suspicion which he held he put to the proof in a very ingenious manner.

Certain heifers were brought from different farms in the Aliwal North district, and their blood was inoculated into calves which had been born at Dr. Theiler's station and had been kept tick-free since birth. While most of these calves developed red-water and *anaplasmosis*, one developed a pure infection of *anaplasmosis* only. This calf when tested later with blood from a heifer inoculated in England with a pure infection of *Piroplasma bigeminum* yielded a red-water reaction, thus shewing that the blood of the Aliwal North heifer with which it was first inoculated contained anaplasms but not piroplasms.

Experiments were then conducted to prove whether the blood of this heifer would again produce a pure infection of *anaplasmosis* when injected in freshly imported English heifers, and this it was found to do. On recovery from *anaplasmosis*, however, these animals did not prove immune to *piroplasmosis* (red-water), from which it was determined that red-water and *anaplasmosis* are two different diseases.

When the *Anaplasma marginale* was studied more closely it was noticed that the severity of the illness caused by inoculation varied, sometimes assuming a severe and fatal form, and sometimes running a mild or benign course. So marked was this that Dr. Theiler came eventually to distinguish two varieties of *anaplasms*, namely:

- (1) *Anaplasma marginale* (proper) which caused a severe and often fatal malady, and
- (2) *Anaplasma marginale*, variety *centrale*, which, while causing a comparatively mild disease nevertheless conferred to the animal on recovery a marked degree of protection against the severe form, and this fact

was of the greatest practical importance, for as we shall see later it led to a method of artificially conferring immunity.

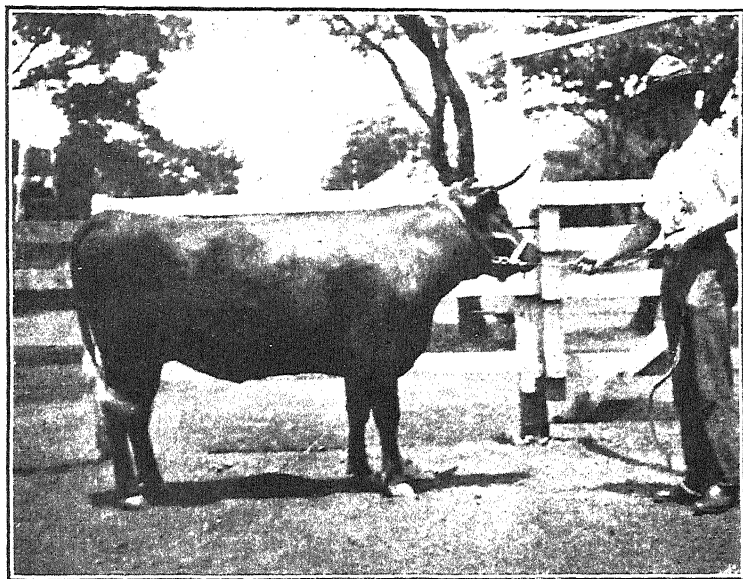
Although the two parasites *Piroplasma bigeminum* and *Anaplasma marginale* were found to be separate entities, they possessed many features in common. In the first place it was found that they were both conveyed through the bite of the larval blue tick whose mother had previously fed on an infected ox, and it must be pointed out that almost every ox bred in Rhodesia must be regarded as infected, that is to say, it carries in its blood these two species of parasite. In such cattle, however, a balance or tolerance has been established, as it were, between the parasites and the resistant elements of the host, so that, in ordinary circumstances, no ill effects are produced by the parasite on the host which supplies it with the necessities of life.

But if a few drops of the blood of such an animal are taken in a syringe and are injected under the skin of a susceptible bovine—that is to say an imported animal, or one never before submitted to the bite of an infective tick—the parasites being no longer held in check by resistant elements (antibodies) are able to reproduce with extraordinary rapidity and, getting out of all control, to produce their ill effects—sickness and often death.

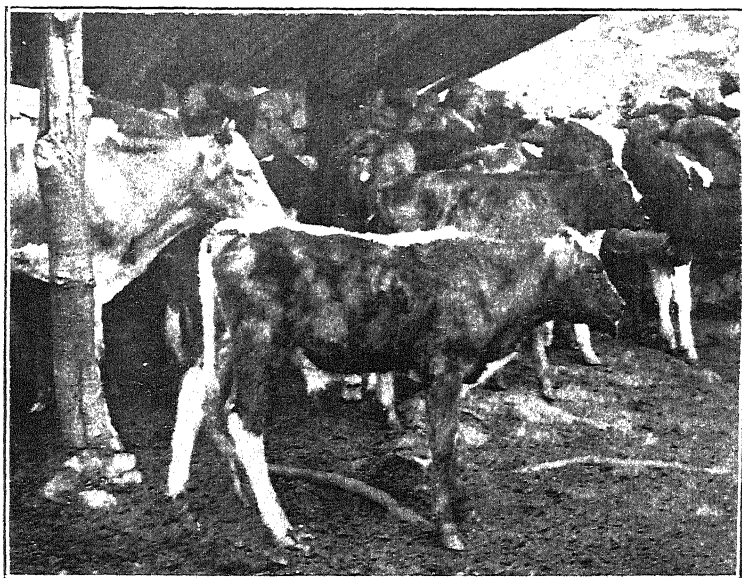
In such circumstances the *Piroplasma bigeminum* develops, first producing a high temperature on or about the sixth day after inoculation and symptoms of redwater during the following week. When the animal has been thus weakened, the *anaplasma*, which has a longer period of incubation varying from three to five weeks, asserts itself and not infrequently brings about a fatal issue.

About three years ago it was found by two investigators, Nuttall and Hadwen, that a certain dye had a harmful effect upon *Piroplasms* and acted almost as a specific, and when this drug was inoculated into an animal heavily infected with *Piroplasma bigeminum*, the parasite was destroyed and rapidly disappeared, the animal thereafter becoming immune.

This discovery robbed red-water of half its terrors, but the *anaplasma*, being unaffected by the drug, remained. The



Sussex Heifer, "Romney Lass," which supplied the Standard Virus used in the inoculation against Anaplasmosis.



Calf suffering from Anaplasmosis.

separation of the mild immunising elements (*variety centrale*) from and protecting against the virulent variety, led to the hope that the problem of the protecting of imported stock had been finally disposed of.

As we have said before, these diseases are in nature transmitted by the blue tick; the adult or mother tick having engorged upon an infected ox, the parasites pass through her many thousands of eggs to the larvæ hatching from them, and each larva—though smaller than a pin's head—is capable of inoculating a susceptible animal to which it attaches.

Thus it is that in Rhodesia every calf that is born is from its earliest days infected with these diseases, from which it suffers more or less severely, but may finally recover when the balance between parasite and resistance, which we have mentioned, is arrived at; nevertheless, such animals constitute a permanent reservoir of virus from which ticks can draw for the perpetuation of the infection.

We have already explained the principles upon which Dr. Theiler's method of immunising is now based, but prior to these discoveries a satisfactory method of inoculation had been adopted at this Laboratory, based upon the knowledge that the virulence of the diseases varied in certain circumstances, and by thus selecting a virus so mild as to give rise to a light attack from which the animal recovered and derived immunity.

The principles upon which the selection was made may be enumerated as follows:—

(a) The disease runs a less severe course in young than old animals.

(b) Indigenous herds of cattle suffer less severely than imported or "improved" breeds.

(c) The virulence intensifies by frequent passage, that is to say where ticks and susceptible animals are plentiful.

(d) The disease is most severe in animals whose vitality or constitutional vigour is reduced by other causes.

These points are not mentioned with a view to enabling the reader to select a virus, but to help him to understand

and account for much of the illness that prevails among cattle, and especially young stock in this country. It will explain why the Commonages are the most heavily infected centres—because most heavily stocked, and most highly infested with ticks—and why farms to which cattle are removed from the Commonages and other centres, conveying with them ticks and an intensified virus, are infected in proportion. It will explain why calves in dairy herds, born of parents of “improved” types and so often starved for the the “sake of the separator,” readily fall the victims of these and other maladies commonly associated with them.

It will also shew the danger of exposing imported or improved stock on foul pastures, since these animals, although perhaps artificially immunised against a mild and reasonable infection, cannot be expected to resist the virulent and deadly form of the disease which prevails in such places.

In order the better to understand the symptoms of the plasmoses, one must bear in mind the ways in which blood parasites commonly produce their ill-effects. These may be tabulated as follows:—

1. By the destruction of red-blood-cells.
2. By interference with the physiological properties of the blood.
3. By the production of noxious substances in the blood.
4. Possibly by abstraction of nutritive materials from the blood.
5. By mechanical interference with circulation.

The parasites under consideration appear to be intimately associated with the red-blood-cells, and in some cases of *anaplasmosis* as many as thirty per cent. of these cells are invaded.

Now, the red-blood-cells are carriers of the oxygen upon which the vital processes of the body depend, and if therefore they are reduced in number, or their functions are impaired the whole animal economy must suffer. The blood producing organs are themselves affected so that, in some cases which do not terminate fatally, restoration or repair is slow. The blood being poor in solid elements, becomes

"thin" and watery, of low specific gravity and tends to exude through the walls of the blood vessels, especially where these receive little support from surrounding tissues, as, for example, in the body cavities.

The colouring matter of the blood, *hæmoglobin*, may become freed from the cells and distributed in solution throughout the fluids and tissues and passing into the urine give rise to *hæmoglobinuria* or "red-water," the urine assuming a bloody dark-red or brownish appearance. Or, on the other hand, the *hæmoglobin* resulting from the disintegration of the red-blood-cells may be filtered off by the liver, where its transformation into bile pigment takes place. As a result a biliary staining may occur and the condition known as "gall-sickness" be produced.

The entrance of the bile into the blood is followed by a discoloration of the tissues to various shades of yellow. In the living body this is well seen in the visible mucous membranes, *e.g.*, the lining membrane of the eye-lids, the lips, gums and vulva, or where the skin is not covered with hair. In the dead animal the yellow colour is principally apparent in the subcutaneous tissues, the fat, liver and kidneys.

In practice the *plasmoses* may run an acute, or a sub-acute or chronic course. The former is encountered in imported stock or in young animals where the virus is intense. The latter is the form which generally prevails.

Thus in calves, which by reason of this gradual infection generally suffer from a sub-acute or chronic form of the disease, we find a bloodlessness, general weakness and lack of vitality. Their coat becomes harsh, the skin dry and scaly, and readily infested with ticks.

In young animals the blood has to supply not only immediate wants but to provide for growth, so that the infected stock become stunted and badly developed. Owing to the effusion of the watery elements into the body cavities and dependant parts, affected calves often develop a loose swelling between the jaws and become dropsical or "pot-bellied."

If then such animals are denied an adequate supply of nourishment, or are compelled to take their food in such an

improper manner as to give rise to indigestion, they suffer all the more severely. Moreover, their vitality is so reduced that they readily become the victims of many other ailments such as pneumonia, diarrhoea and dysentery, ophthalmia and other affections generally resisted by a healthy calf.

Let us consider then the various ways in which these *plasmoses* affect the pocket of stock breeders. First of all they render importation of high quality stock for improvement of local breeds an extremely hazardous proceeding, owing to the risk these animals run in "salting" or immunising to these diseases.

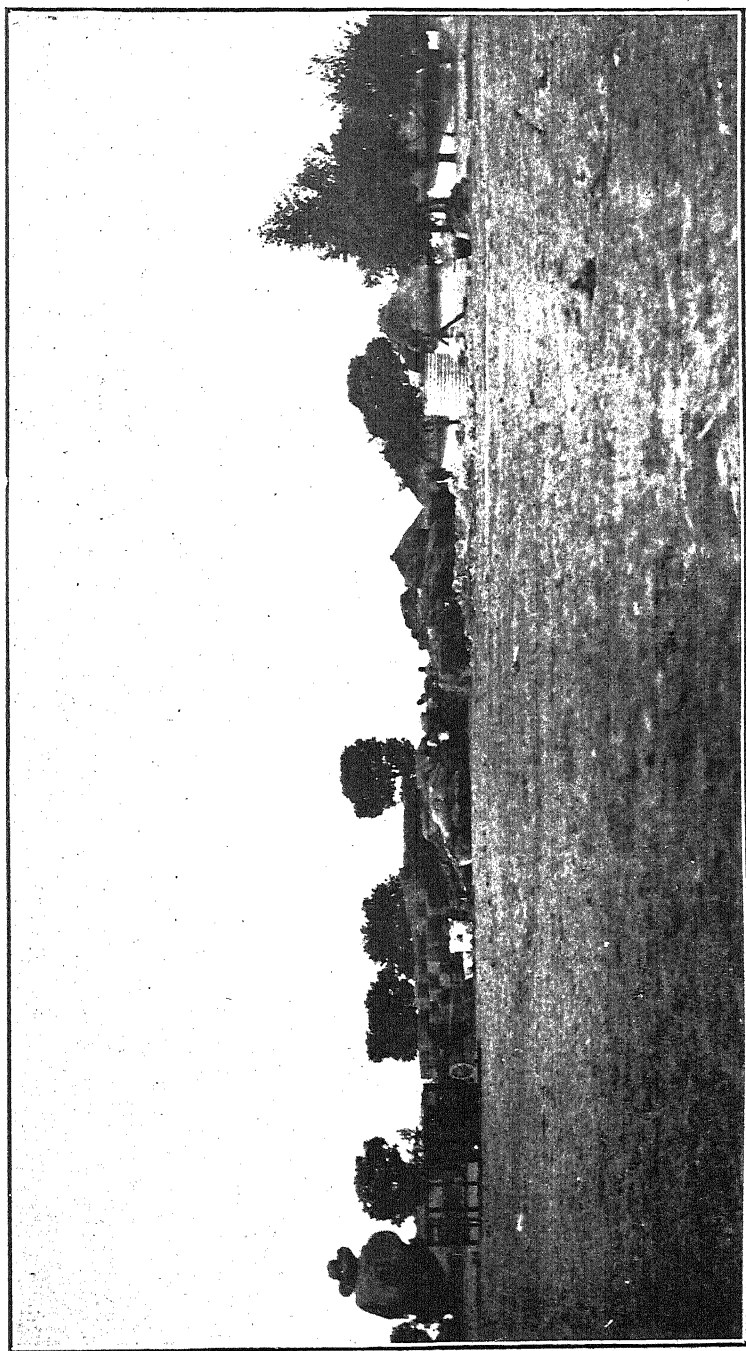
Secondly, they prohibit the too rapid refinement of local breeds, for the benefits derived from the better types are reduced by the greater susceptibility of the progeny to infection.

Thirdly, they check the growth and development not only of imported animals, but especially of young stock of all varieties.

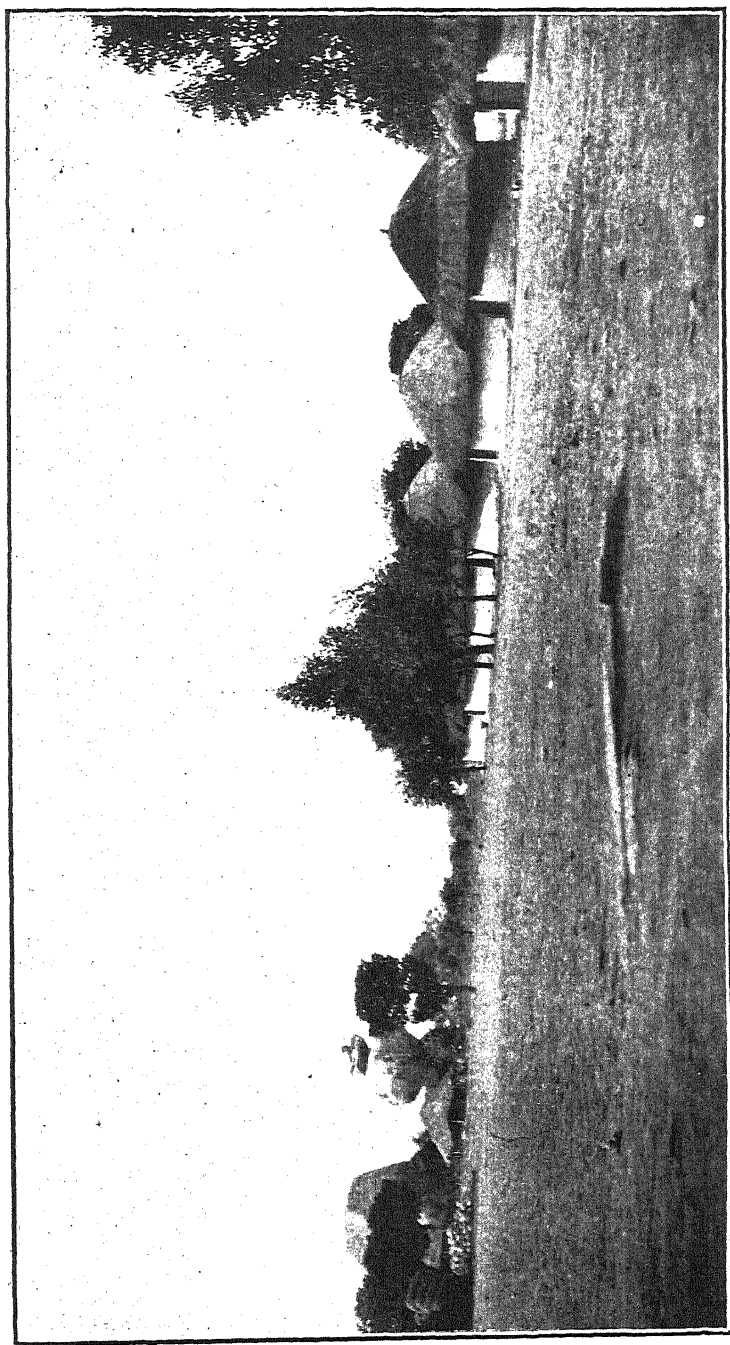
Lastly, they bring about a loss of vitality in young animals which predisposes them to other ailments.

It must, therefore, be granted that it is to the interest of the stock-raising industry and to the individual that these diseases should be eradicated or controlled.

In any campaign against them the first operations must be directed against the natural transmitters of the disease, the blue tick. It is fortunate that this tick is a particularly easy one to deal with, for two reasons; first, because it remains on one host during the various stages of its development, that is as larva, nymph and adult; and taking from three to four weeks to complete its development, is unlikely to escape any regular system of dipping; and secondly, because this tick is particularly vulnerable to arsenical preparations. The methods of dipping now enforced as a precautionary measure against African Coast Fever, apply equally against the *plasmoses*. That it is possible entirely to eradicate *plasmoses* from a farm by dipping has been proved in at least three instances in this country. Cattle removed from a tick-free farm at Penhalonga contracted red-water at Marandellas; animals from a farm at Marandellas where dipping was



Government Inoculation Station, where imported animals are inoculated against Anaplasmosis.



Government Inoculation Station, where imported animals are inoculated against Anaplasmosis.

practised died on removal to an infected adjoining farm; and again, yearlings sold from a tick-free farm near Salisbury contracted the disease some months after purchase.

These examples will be used as an argument against the rendering of a farm tick-free and red-water-free whilst other areas remain infected, and there is justice in the objection. It might be advisable in the present state of things to rest contented with a light infestation within the limits of control.

On the last farm referred to, the eradication of the ticks and the diseases due to them has co-incided with a marked reduction in the number of calf ailments on the property, and a remarkable increase in the growth and development of the young stock. This represents pounds, shillings and pence to the owner.

The objection that the cattle are now as susceptible to natural infection as newly imported stock, has been overcome by providing an animal having a standard mild type of the disease from which virus is taken for the inoculation of the stock on the farm at a time when they are best able to resist and the re-actions can be watched and controlled.

In conjunction with the eradication of ticks better conditions of hygiene should be adopted. If the calf is to become healthy and make growth it must be provided with suitable food under suitable conditions.

With regard to the treatment of larger animals suffering from the *plasmoses*, trypan-blue is invaluable in checking the *piroplasmosis*, but is ineffective against the *anaplasmosis* which in the present state of our knowledge can only be combatted by careful nursing and a diet which can be digested, assimilated and made use of to replace and repair the loss of tissue caused by the disease.

Animals which have recovered take a considerable time before they regain their normal health and tone and require "building up." In the case of bulls too much should not be expected of them at first: for their own sake they should not be called upon to serve too many cows during their first season, and indeed it is not profitable that they should do so because their progeny would also suffer. They should not

be expected to travel long distances with the herd, especially in hot weather, but rather should be kept in a large paddock with one or two quiet animals as companions, and selected cows when "in use" should be brought to them.

With regard to calves which are not allowed to run with their mothers, it is not sufficient to give them separated milk alone or with mealie meal, since neither contain the essential elements in proper proportion.

The following scheme kindly drawn up by Mr. G. N. Blackshaw, Government Agricultural Chemist, affords an idea of what is necessary in the

HAND-REARING OF A DAIRY CALF.

First two or three days.—Calf allowed to draw milk from dam.

After weaning, warm milk (not skim) fed from pail three times a day until calf 2 to 3 weeks old. (10 lbs. a day at first and end with 15 lbs.), after which skim milk gradually substituted.

From 1½ to 2 weeks should pass in changing from full milk to skim milk, mealie meal and crushed linseed.

CALF RATION.

Available Foods:—

Skim Milk.
Hay.
Mealie Meal.
Crushed Linseed.

For a Calf 160 to 200 lbs. live weight:—

Mealie Meal	... 90%	} Mixture per day 1½ lbs.
Crushed Linseed	10%	
Skim Milk	... ..	13 to 18 lbs. per day.
Hay	... ..	about 3 lbs.

This amount may be reduced in the case of calves of smaller types.

The following lick, also suggested by Mr. Blackshaw, should prove of considerable value in supplying the salts necessary for development of bone.

CATTLE LICK.

Sterilised Bone Meal.	$\text{Ca}_3(\text{PO}_4)_2$	60 or 64 parts.			
Chalk	CaCO_3	10	10	„	
Common Salt ...	NaCl	20	20	„	
Epsom Salt ...	MgSO_4	5	3	„	
Sulphate of Iron ...	FeSO_4	5	3	„	
		100	100		

It was not intended that this article should develop into a treatise on the feeding of live stock, but the treatment and repair of the disease under consideration is so closely associated with proper nutrition, that these remarks have become necessary to complete an article which is hoped may prove of practical value.

Pig Feeding.

Experiments have been conducted at the Wisconsin station to test the value of cooked potatoes, fed in addition to maize meal. The average amount of maize meal to produce 100 lb. increase in the gross weight of the pigs was 440 lb. or 4.4 lb. of meal for each 1 lb. of gain in the live weight of the fattening pigs, which at the commencement of the trials weighed between 200 lb. and 300 lb. each, so that this was a return somewhat above the average; yet a far better outcome was registered where about 3 lb. of cooked potatoes were fed with each 1 lb. of meal, as then only 262 lb. of meal were eaten, in addition to 786 lb. of potatoes, to obtain 100 lb. increase. Thus it is shown that rather less than $4\frac{1}{2}$ lb. of cooked potatoes are of equal value to 1 lb. of meal when fed in conjunction with meal in proportion of 1 lb. of meal to 3 lb. of potatoes. Other experiments carried out in Denmark, where rye and barley meal were fed in lieu of maize meal, showed that 4 lb. of cooked potatoes when fed with a certain proportion of meal gave a return of 1 lb. increase.

At other agricultural stations mangels, swedes and carrots were proved to be of about half the value of cooked potatoes in addition to a certain proportion of meal when fed to fattening pigs. On the other hand, artichokes fed raw possessed a feeding value equal to cooked potatoes. Artichokes are grown for pig feeding to a considerable extent in the United States, but the more usual way of feeding them is to fold them off by pigs, the latter receiving in addition a certain quantity of whole maize. Thus the labour bill is reduced to the lowest possible limit.

Anaplasmosis of Sheep.

By LL. E. W. BEVAN, M.R.C.V.S.,
Government Veterinary Bacteriologist.

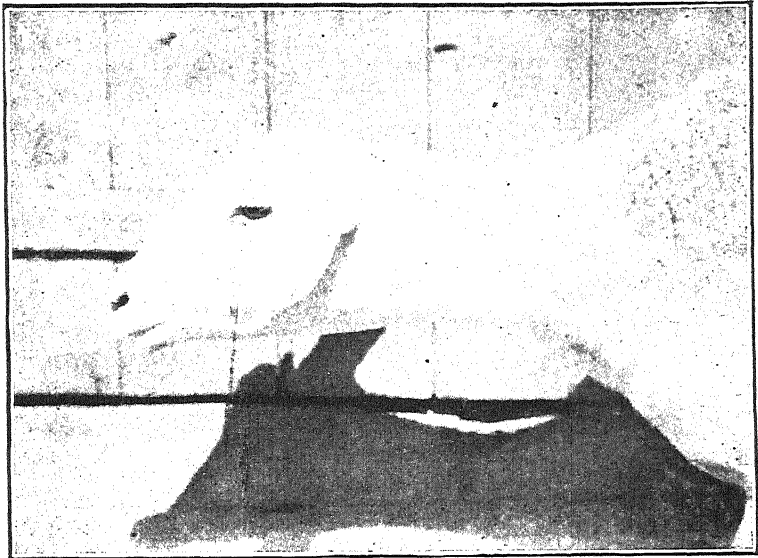
During the past month several outbreaks of sickness among sheep have been reported to the Veterinary Department.

The symptoms described have varied but in nearly all cases the most noticeable feature has been the condition known as "bottle jaw," that is to say a dropsical condition of the throat. In many instances this has been the only symptom described, but in some outbreaks where the disease has assumed a more acute type, the picture presented has very closely resembled that of a sheep suffering from wire-worm, namely, dropsical swelling of the throat and abdomen ("pot-belly"), falling off in condition, pallor of the mucous membranes, dryness of fleece, and loss of the oily condition natural to it.

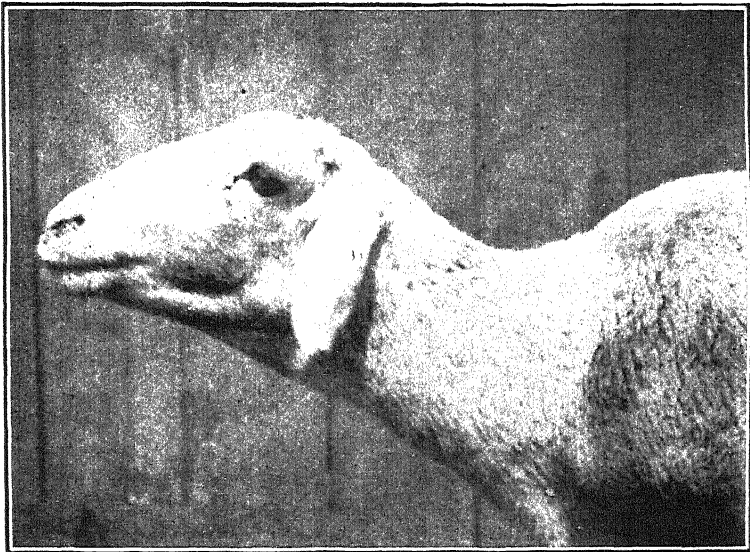
In one instance the sick animals were considered by men experienced in the disease known as "blue tongue," to be suffering from that malady, while in another outbreak where one or two sheep, which died, were found to be bile-stained, the disease was diagnosed as "gall sickness."

One outbreak was personally investigated in a flock of mixed local and half-bred Persian sheep. The owner, who first noticed that something was wrong by the swelling under the jaw, stated that it had appeared suddenly in the lambs after the heavy rains and flush of new grass in the vleis. When the flock was examined the condition was making its appearance in the older animals, but it was remarkable that those sheep showing any wool had at that time escaped.

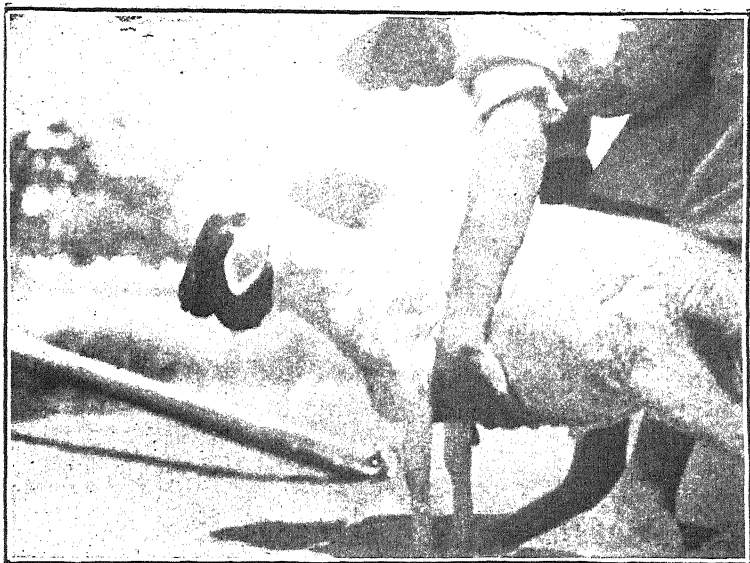
The affected animals were certainly not in bad condition; on the contrary, they handled well and their skins were oily and supple. No deaths occurred at the time but a few have been reported since.



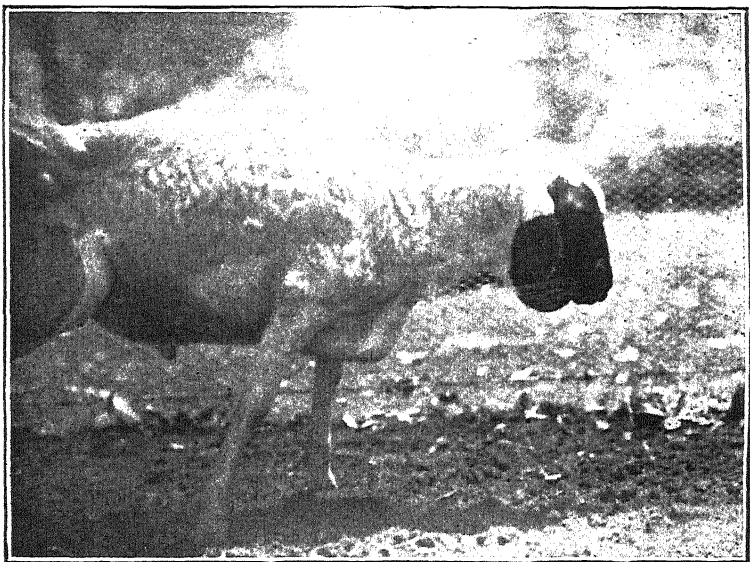
Anaplasmosis of Sheep.—Sheep artificially infected from the naturally infected lambs shown over-page.



Anaplasmosis of Sheep.—Sheep artificially infected from the naturally infected lambs shown over-page.



Anaplasmosis of Sheep.—Naturally-infected Lamb, showing the condition known as bottle-jaw.



Anaplasmosis of Sheep.—Naturally infected Lamb, showing the condition known as bottle-jaw.

Blood was taken from several affected animals, and when examined under the microscope shewed a parasite in the red cells resembling the *Anaplasma* of Cattle. In addition all the changes of the blood associated with *Anaplasmosis* were encountered, namely: *anisocytosis*, *poikilocytosis*, *polychromatophilia* and basophile granulations. Blood counts shewed that the red-blood cells had fallen to nearly half their normal number.

As a result of this discovery the officers of the Veterinary Department were circularized, and similar preparations from sick sheep have already been sent for examination from Makwiro, Macheke, Selukwe, Shangani, South Mazoe (Gwebi District), Umtali and other districts, which shews that the disease has a wide distribution throughout the country.

It is more than probable that many of those outbreaks hitherto attributed to wire-worms may have been due to *Anaplasmosis*.

The object of the present note is to persuade flock owners to notify any sickness among their sheep to the officers of the Veterinary Department, or to forward blood preparations and ticks collected from their sheep to the Chief Veterinary Surgeon or Government Veterinary Bacteriologist, in order that the disease may be carefully investigated at the Laboratory.

Argentine Maize Output.

Reuter's correspondent in the Argentine reports that the wet nature of the harvest season continues, and as a consequence, harvesting operations are much delayed. In a large degree, however, this is a decided boon, as it minimises the effects of the railway strike.

Nevertheless, a serious situation exists. Stations are congested with the crops, and the rain is doing much damage. The final result may be more serious than appears at present, and dealers are adopting an attitude of caution.

The whole position turns on the maize crop, and it is much too early to form a decided opinion on this matter. So far everything has gone well, and the crop may be almost a record one.

Telegrams from Santa Fe show that the locusts have put in appearance, with the usual damage. From other quarters, however, the news is more favourable, and well-informed opinion takes the view that any great danger is over.

Ticks on Sheep in Tasmania.

IMPORTANT GOVERNMENT EXPERIMENTS.

In the Australian State of Tasmania the dipping of sheep for the destruction of ticks is compulsory. The question of the possibility of eradicating the tick, as effectively as scab has been exterminated and kept out of Tasmania for thirty years past, having been raised before the Clarence Board of Agriculture, the Tasmanian Director of Agriculture instructed the Chief Inspector of Stock to make certain experiments, one of which was to determine the certainty with which an arsenical powder dip kills ticks and keeps sheep clear of them.

The Director of Agriculture, in his annual report 1910-II, presented to both Houses of Parliament, states, with respect to this experiment, that:

“Were dipping in a solution of such strength as will kill every living tick and remain on the wool long enough to kill every young tick that hatches from the pupæ made compulsory, this great scourge of the sheep breeder can be stamped out. The experiments conducted by the Chief Inspector with sheep under control show that every tick can be destroyed, provided that the dipping is carried out in a proper manner, and that sheep so treated remain perfectly free from ticks.”

(Signed) ALBERT H. BENSON,
Director of Agriculture.

The Chief Inspector of Stock reported to the Minister of Agriculture with reference to the results of the experiment which he carried out:

“The certainty with which an Arsenical Powder Dip kills Ticks.”

The dipping tests upon experimental sheep, in and out of the wool, justify all that is stated in favour of this dip as a tick-destroyer. The sheep that have been dipped are now located at the quarantine station and will be exhibited at the show.

Two sheep badly infected with ticks were received into the pens provided for them on the 3rd October last. One sheep was shorn and dipped; the second sheep was dipped in its wool of nine months growth. The sheep was immersed in a dip prepared from an arsenical dipping powder of the strength as recommended in the printed instructions which are set forth on the outside of every packet. The time of immersion was one minute by the watch, held by Mr. Black. This was at nine o'clock in the morning. At noon of the same day at least 30 ticks were found dead upon the floor of the shed in which the shorn dipped sheep had been placed. The following day (4th October) a few live ticks were found. On the 5th October, at 3 p.m., one live tick was found on the sheep; but on the 6th the sheep was found to be free from ticks. The sheep was inspected every day for 10 days, when it was hand-infected with five live ticks, and in 26 hours these five ticks were found dead upon it. In a week hence four ticks were placed upon the sheep, but after watching them for two and a half hours they would not keep upon the sheep, so were killed. The dipped unshorn sheep was perfectly free from ticks with the one immersion. Most of the pupæ were rendered sterile, and the few that incubated died.

These sheep were sent to the quarantine station on the 7th November, 1910, where they are now absolutely free from ticks, and the wool in splendid order.

On the 2nd of November two more ticky sheep were received. One was shorn and dipped in the same kind of preparation, and same time of immersion, with the same result, viz., all the ticks died within 30 hours. One sheep was not dipped, but kept in the wool, it having ticks upon it. After a lapse of ten days and many inspections of the shorn dipped sheep (no ticks being found upon it) it was placed in the pen with the undipped ticky sheep, and in half an hour three ticks were found upon it (the dipped sheep), which was then taken out of its pen and placed by itself, and in less than 26 hours two of the ticks were found dead and one very sick. The shorn dipped sheep was again placed with the undipped ticky

sheep for a space of three weeks and was never again found to be infected.

These sheep were sent to the quarantine station, where they now are, and perfectly free from ticks. The wool is in splendid condition, being bright and strong.

To sum up, one dipping with an arsenical dip, prepared in the manner as directed on the packets, is sufficient to destroy all living ticks, and the dip which remains on the wool is also sufficient to destroy all newly hatched out ticks.

The result of this experiment, although very incomplete, will I feel sure, disprove the notion held by many owners that ticks are spontaneously bred on the sheep, and with this theory argue that the tick pest cannot be eradicated. These ascertained facts in themselves are a great step in the way to further information being acquired and disseminated amongst sheepowners, and will, in a most unquestionable manner assist sheepowners to solve to their own interest and satisfaction the best method in which the eradication of ticks is effected. They should not forget to be thorough in their work, and collect every sheep and dip in an effective dipping preparation, the results of which would at once dispel old traditions spontaneously expressed, unsupported by observation and corroborative evidence."

(Signed) THOMAS TABART,
Chief Inspector of Stock.

The arsenical powder dip used in these experiments was Cooper's, and they showed that this dip not only kills the tick present at the time of dipping, but it also remains in the fleece and kills all newly hatched ticks; and further, that live ticks placed upon a Cooper-dipped sheep are killed, and that such sheep remain clear of ticks when kept in contact with tick-infested sheep, for it was proved that ticks will not, or cannot take up their abode upon Cooper-dipped sheep.

An interesting clause in the Chief Inspector's report runs as follows:

"SCAB IN SHEEP."

"The question of scab in sheep can be dismissed from comment, for since its extermination in 1881 (thirty years ago) no recurrence of the disease has ever taken place."

Prizes for Entomological Collections.

In order to stimulate interest in the many insect pests in Southern Rhodesia the Administration has decided to offer prizes at the three Annual Agricultural Shows at Salisbury, Bulawayo and Umtali for the best collection of insects of economic importance, that is, those which injure cultivated plants, domestic animals, etc. The first prize offered is £3 and the second £1, but the right of withholding either prize is reserved should the number or quality of exhibits be deemed insufficient. The following simple rules should be observed by exhibitors.

- (1) The collection should be divided into:—
 - (a) Pests of trees, including insects attacking fruit.
 - (b) Pests of crops, such as maize, tobacco, potatoes.
 - (c) Pests of vegetables, such as beans, marrow, cucumber, cabbage, etc.
 - (d) Pest of animals, including man, especially blood-sucking flies, floor maggots and similar insects.
- (2) Adult insects should be pinned, caterpillars and chrysalides can be preserved in methylated or other spirit in small tubes or vials. Aphides (green-fly, etc.,) should also be preserved in spirit. Scale insects only need drying and can be shown on the twigs, leaves, etc., which form their habitat. The few necessities in the way of apparatus such as insect pins, glass vials, etc., can be obtained from Messrs. Heynes Mathew, Ltd., Capetown, the only firm in South Africa, it is believed, which stocks this class of goods.
- (3) Scientific names are not expected, but the exhibitor should state to what order each insect belongs, *e.g.*, whether it is a beetle, a moth, a bug, a scale insect or a fly. Technical information concerning insects meant

for exhibition will be willingly furnished by the Government Entomologist at any time if specimens are submitted to him.

- (4) Each insect should be accompanied by a short description in writing of the damage it does and the plants, etc., it affects. Specimens of injured plants, etc., would form a good addition to the exhibit. An endeavour should always be made to obtain the adult insect where caterpillars and grubs are concerned in causing damage.
- (5) Two or more collectors may collaborate to form an exhibit.

This competition is open to all, but is expected to appeal chiefly to farmers' sons. Any further information or advice may be obtained by application to the Government Entomologist, Department of Agriculture, Salisbury.

Maize Export.

The total number of bags of maize exported from Union ports during January was 17,171, as compared with 95,223 bags during January, 1911. The Transvaal exported 7,016 bags, the Free State 9,876, Natal 139 and the Cape 140. From the Transvaal 6,130 bags went via Port Natal, while the Free State sent 6,154 bags via Natal and 3,617 via Port Elizabeth.

Winter Cereals without Irrigation.

*(From a paper read before the Dry Farming Congress,
Pretoria, October, 1911.)*

By H. GODFREY MUNDY, F.L.S., etc., Government
Agriculturist and Botanist.

Owing to the short notice which I received of the date of the meeting of this Congress, I have been unable to prepare any lengthy or elaborate paper. I propose, therefore, to deal with the subject mainly from a practical standpoint and to confine my remarks to a discussion of what is broadly termed "dry land farming in South Africa," and to placing before you a few facts regarding winter cereals without irrigation in Southern Rhodesia, hoping that by so doing, Rhodesian experience may be of some benefit to the farmers of the South African Union.

Before going further, however, I should like to make one observation on a point which has struck me very forcibly when considering the question of dry land farming in South Africa, and also when listening to the many interesting papers and discussions before the Congress this session. It appears to me that if the farmers and agriculturists of South Africa are to form a true conception of what this method of farming may mean, then a well-marked distinction must be recognised between the growing of summer crops, as for example: maize, manna, kafir corn, potatoes and beans assisted by a summer rainfall of 15 inches to 25 inches, and the production of winter cereals such as wheat, oats and barley practically or entirely unaided by any precipitation whatever. Excluding varieties of cereals resistant to rust, and which can be grown therefore during the rainy season and where irrigation cannot be practiced, it has been suggested that the production of these cereals can be achieved

by following dry farming methods, even though, except in the few more favoured localities, the growth of the crop during its more critical stages will be entirely unassisted by rainfall.

Scientific investigation borne out in practice both in South Africa and in all semi-arid parts of the world, has repeatedly demonstrated the efficacy of dry farming principles, or in other words, *good farming*, in conserving moisture and checking evaporation during spells of drought in the rainy season. Many delegates present at this Congress doubtless have proved this on their own farms, and the matter is no longer one of speculation, but is an established fact. We may, therefore, unreservedly accept the principle that by following dry farming methods, satisfactory *summer crops* can be grown over considerable tracts of country, where at present, owing to scanty rainfall and indifferent methods of farming, but very poor crops are usually raised. In Mashonaland, where the rainfall varies from 25 inches to 30 inches, continued cultivation of the maize crop after it has "braided" is necessary, and three or four harrowings first with a spike harrow and then with an anti-clog weeder, followed by two or more horse hoeings are generally recognised as desirable tillage operations. It is only the farmer who is scarce of labour or who has "more on his fork than he can lift," who will neglect these after-cultivations. The same remarks apply in a greater or less degree to the growing of kafir corn, beans, potatoes, etc., and if so much stirring of the soil to keep it free of weeds and maintain a soil mulch is found beneficial with a twenty-five to thirty inch rainfall, how much more necessary it must be in semi-arid districts, where the rainfall may not exceed twenty inches.

The question of growing winter cereals unaided by rainfall or by ultra-normal conditions is on a totally different plane however, and as far as I am aware, it yet remains to be proved that this can be done profitably, on practically any type of soil as has sometimes been inferred, if not actually stated.

Soil and sub-soil are the governing factors influencing the success or failure of the applied principles of dryland farming for the production of winter cereals, and while needless to say I am a staunch advocate of thorough preparation of the

land and after-cultivation in order to tide summer crops over periods of drought, I must admit to being doubtful whether dry farming in South Africa with winter cereals unassisted by favourable natural conditions of soil can be made a financial success. For the present therefore, and until wider and more conclusive experiments have been conducted, I think the practical farmer would do well to confine his efforts to grow winter cereals without irrigation, to those soils which are naturally more or less retentive of moisture. Thus far in Southern Rhodesia, and apart from Citrus fruit growing without irrigation, little has been done in dry farming winter crops except where soil conditions are naturally favourable, but where such conditions obtain, result have been eminently encouraging.

The keynote of dry farming is capillarity and to dry farm successfully a knowledge of the factors governing capillarity is necessary. Briefly stated the principle of capillary attraction is that each minute soil particle is more or less surrounded by a thin film of soil moisture. The greater the number of soil particles the greater the amount of soil moisture that can be held in suspension. As evaporation from the surface, caused by wind and sun, takes place, a gradual stream of water passes up through the minute pores or tubes formed between the soil particles and replaces the surface moisture, which has been absorbed, and this goes on indefinitely unless steps are taken to check it. The maintenance of a loose mulch on the surface breaks the connection of the capillary tubes, and surface evaporation is reduced to a minimum since the moisture rises to the height of the mulch and is there held in suspension.

The ideal conditions for dry farming are :—

- (a) An impervious layer of sub-soil formation at a certain depth below the surface, the deeper the better, depending, however, upon the lifting power of the soil.
- (b) A moderately light and friable surface soil which can be worked again shortly after rain without too greatly packing the lower layers, and the top layer of which by cultivation can be maintained in the form of a loose mulch or dust-blanket.

- (c) An intermediate stratum of fine grained but not too porous soil, capable of holding large supplies of soil moisture which, in course of time, will be drawn upward by capillarity into proximity to the roots of the growing crop. This intermediate layer should be neither too clayey nor too gravelly, since both these conditions check the upward flow of soil-water and such soil is incapable of holding as large amounts of moisture as can one of a fine grained, loamy texture.

Upon our own or nature's ability to provide sufficient storage depends the success of the crop.

Fully one-half of the soil of Southern Rhodesia is derived from granite formation, and through a large part of this tract, depressions in the contour of the country cause what are known locally as granite vleis. Many of these soils naturally fulfil the most exacting requirements of the dry land farmer. The granite vlei is composed generally of a mixture of coarse and fine grained sand, closely intermixed with a high percentage of decayed organic matter and silt, and in effect, producing a loamy soil. It is of varying depth, and being usually underlain by a mass of more or less impervious granite rock or black or yellow clay, the water is held in suspension and the soil remains moist throughout the whole winter at a few inches below the surface. The latter being composed of coarser sand readily forms an effective mulch, and thus checks evaporation. During the rainy season, many of these vleis are too wet to grow summer crops unless an extensive system of surface drainage has been introduced, but owing to the open nature of the intermediate layers of soil excess of surface water rapidly passes down as the dry season advances.

Speaking broadly, the granite country is more or less similar throughout the whole of Southern Rhodesia, but the extent of naturally moist soil varies according to the general contour of the country and the average annual rainfall. Typical examples are found in the Makoni, Mrewas, Marandellas, Insiza and Charter districts, and also throughout the tract of country known as the Somabula Flats, while there are many similar and larger areas in other districts. Where irrigation

has not been available, farmers have for years grown small crops of winter forage—barley and oats—on naturally moist soil, and, within the last two seasons, more systematic experiments have been conducted, but as yet these also only on a relatively small scale. It is by no means an uncommon practice with some farmers to plant early potatoes in August, on damp land, in order that the crop may be lifted in November when potatoes are relatively scarce. Similarly, many of the native kraals plant their maize on vlei ground during the same month, and thus sometimes secure two crops in the same season from the same ground. When local supplies of maize were less abundant than now, and when, owing to shortage of stocks, early maize in March and April often commanded a premium, some farmers, favourably situated, planted their vlei land crops in August and September, before the commencement of the rains. In order that this could be done, the soil must have retained its moisture throughout the five winter months and there remains, therefore, no reason why the land instead of lying idle, should not have been carrying a crop during that time.

Vlei soils are not, of course, confined to the granite, but in sandstone, ironstone and diorite areas, where the vegetation is relatively more rank, and containing, as they usually do, an excess of decayed vegetable matter, they partake more of the nature of peat or heavy turf soils. Experiments which have thus far been carried out appear to indicate that such land is often unsuited to wheat growing, though producing good crops of oats, rye, potatoes and onions. On an excessively peaty soil wheat frequently fails to set grain. Further, on land of this character, it is often impossible to cultivate sufficiently soon after rain, and even where this is done, the tendency is to pack the lower six inches of surface soil too firmly.

The behaviour of the soil under tillage operations is therefore of the utmost importance, and dry farming methods can be most easily applied to deep soils containing a considerable percentage of sand and humus.

From an acquaintance with the soils of South Africa, and particularly of the Transvaal, it appears to me that there

must be considerable tracts of country which might be utilised in a similar manner, and from Rhodesian experience, I can now say without hesitation that where natural conditions of soil favour the retention of moisture during the dry season, successful and profitable crops of winter cereals can be grown. On poor soils it may be necessary to use kraal manure or green manure crops, assisted by artificial fertilisers at the time of sowing. It would not appear, however, that while following dry farming methods there is any danger in using artificial manures, provided always the supply of humus or organic matter in the soil is maintained. If wheat growing in South Africa is ever to become of importance to the country, the use of manures both kraal and artificial is, in my opinion, essential.

The enterprising farmer, desirous of putting to the test the dry land methods of farming, can safely do so with his "rain crops," and will undoubtedly meet with a great measure of success, depending, however, in some degree on the nature of his soil. When, however, he turns his attention to winter cereals, unaided by rainfall or irrigation, he will do well to select first the lands where natural conditions assist his efforts, and having conquered these, let him then extend his operations to soils less naturally favourable.

Auxiliary Crops in Arable Farming.

(A Lecture given before the Hartley Farmers' Association.)

By H. GODFREY MUNDY, F.L.S.,
Government Agriculturist and Botanist.

In discussing the question of auxiliary crops in arable farming, it must be remembered that many crops which to-day are considered in the experimental stage or for which there is but a limited demand will probably in the near future be firmly established in a recognised scheme of rotation. If we consider the staple crops of Southern Rhodesia, we are forced to the conclusion that at present there is but one pre-eminent crop—namely maize. Tobacco is now beginning to rank with maize in importance, but it is not grown by individual farmers on the same large scale, and as a rule the tobacco grower seldom devotes much attention to other crops.

Farming methods differ in different districts and under varying conditions of soil, climate and markets, but for the purposes of this lecture I propose to accept the definition that “auxiliary crops” embrace all those which can be grown profitably either for sale direct or for conversion into meat or dairy produce, but which at the present time, for some reason such as peculiar requirements, limited demand or partial uncertainty as to the result, cannot be grown on the same large scale as can maize, and which are often therefore entirely neglected in the general scheme of cropping.

The growing of these crops need not necessarily interfere with the primary activities of the farm cattle-raising, maize or tobacco growing, but the point which I shall endeavour to bring home to you is that an increased acreage devoted to these auxiliary crops can be made profitable. The fact that there is

but one pre-eminent staple crop on each of our main types of soil, viz. : maize on the heavier and tobacco on the light land is the most valid reason why rotation of crop is not already more generally practised, but this adherence to one crop year after year and often on the same land is wrong both in theory and practice, and already on many of the older established farms decrease of fertility is making its unwelcome presence felt. Where artificial fertilisers can be easily and cheaply procured change of crop is not always so essential, but in Rhodesia at the present date it is by the adoption of some form of rotation that this threatened decrease in fertility can most profitably be avoided. The rotation crop should not always be expected to bring in a direct cash return. A bean crop which is grown in order to renovate the land is frequently ploughed under, and in such cases the profit comes with the following crop.

An equally important argument in favour of auxiliary crops is that in a country of limited local markets the farmer is not dependent for his income on *one crop only*; in the event of a slump in one line of produce he is able to fall back upon another. Instancing this, it is common knowledge that in some years the supply of potatoes exceeds the demand; another year it may be pumpkins or onions or oat forage, but under present conditions there is never a season but what one or other of the subsidiary crops is commanding exceptionally good prices.

In all countries and particularly in Southern Rhodesia, in order that side line crops may be grown to the best advantage it is necessary that a varying proportion of them should be home-fed, and the simplest method of converting such feeding stuffs into animal products is by the feeding of pigs or dairy cattle. A bacon factory will shortly be established in Bulawayo, which will afford a market for all the pigs of good average quality which can be produced in the near future. It must not be inferred, however, that to utilise side crops profitably the farmer must be a very large pig keeper or breeder. All that is required is that he keeps a few pigs to which under ordinary circumstances the more inferior or waste produce can be fed, but which in the case of a slump in any crop, would be fed more largely on that particular one.

Successful farming requires the application of common sense and business methods just as much as any other commercial enterprise, and it is the man who is in a position to take advantage of a good market or who has the forethought to "save" in face of a falling market who makes farming a profitable venture. In other parts of the world in an unfavourable grass year, graziers who are fortunate enough to have good grass, purchase cheaply as many store cattle as can be carried on their pastures, and are thus in a position to sell when fat cattle are up in price; similarly, the farmer with a more than ordinarily good turnip crop will purchase hoggets from a district where feed is less abundant, and fatten these in addition to the number he would carry in a normal season. Rhodesian farmers who are practising "mixed" farming must apply the same principles, modified however, in accordance with local conditions.

Some critics will perhaps argue this is looking too far ahead, and that farming in Rhodesia is not in a sufficiently advanced state to warrant such advice. The reply is that success depends upon our ability to look ahead, and to anticipate as far as possible each successive move in the path of progress or altered conditions.

Another aspect of the case, of considerable importance, is the question of labour. By the growing of catch crops or subsidiary crops, labour requirements are lessened since both the planting and reaping seasons are spread over a wider period, while in addition some crops are cleaning crops, that is, they are cultivated during the period of growth while others such as manna, oats, velvet beans and pumpkins are to a greater or less degree smother crops and require but little after cultivation.

The advantages of growing a series of auxiliary crops and thus providing for a rotation, may therefore be summarised as follows:—

- (a) A rotation of crops can be planned by which means land is rested from the staple crop every fourth or fifth year.
- (b) The rotation crop may, in some cases, be a leguminous one and thereby a soil renovator.

- (c) *Fertilisers and manure can be applied to those crops which are relatively the most profitable.*
- (d) Advantage can be taken of high prices for any particular lines of farm produce during a certain season.
- (e) Labour requirements can be reduced.
- (f) Risks can be lessened.
- (g) Land can be kept freer of weeds and in better physical condition.
- (h) Threatened losses from over-supply of local markets can be avoided and can often be converted into profits by home feeding of products to pigs and dairy cattle.
- (k) The question of controlling insect and fungoid diseases is also of importance, but need not here be dilated upon.

Reverting to the definition that auxilliary crops are those which can be grown profitably to a varying extent either for sale direct or for home feeding, we are next brought to a consideration of those which best answer this description and in spite of the limitations due to having but one principal staple crop, it will presently be seen that the selection is wider than may at first be apparent. It will not be possible to deal in detail with the crops to which reference will be made, nor is this necessary, since the respective cultural methods applying to many of them have already formed the subject of special farmer's bulletins or articles in the AGRICULTURAL JOURNAL.

POTATOES.—A certain well-known Rhodesian farmer, not long ago made the following observation. "We always grow a few acres of potatoes, and though one year out of three they are hard to dispose of, the good price realised in one or other of the following years makes the crop a very profitable one." The mistake which most farmers make is to neglect in their next planting any crop of which there was an over-supply the previous year, and thus with nearly all our farm produce the supply is uncertain, prices rush up and down, the consuming public suffer, and the

farmer who has faith in the crop, and plants regularly, alone reaps the reward.

Early crop or new potatoes which, either by means of irrigation or naturally damp land, can be marketted from November to February almost always command good prices, but the date at which the farmer can expect to raise his tubers must be governed by the peculiar conditions of each farm. Normally, planting in August and harvesting from November onwards is practical, but planting in July is possible on some farms comparatively free from frost.

With main crop potatoes also, good profits can be made, especially where a mine contract can be obtained or where imported tubers are grown for seed the following season. The latter is a form of specialised farming permitting of considerable expansion. The conditions under which the main crop is grown permit of liberal manuring which will be reflected in the following crop whatever it may be.

A mistake, which I think it must be admitted many are liable to make, is the asking of an excessively high price for produce. It seems not improbable that if the average price were lower, the consumption of potatoes, especially on the mines, would be considerably increased.

BEANS.—The supply of beans is almost always unequal to the demand and with prospects of greater strictness in enforcing the regulations for the feeding of Native labour, the demand will increase. Choice can be made from the many varieties of Cowpea and also the white or red Canadian Wonder, the white Haricot, the Khaki and the Sugar Bean. The first named are valuable soil renovators while the bean itself, which is very similar to the Kafir bean of which the natives are particularly fond, would be popular for boys' rations. All varieties of Cowpea are eminently suited for stock feed either green or dry, the average yield of grain from the best types being at the rate of about five to eight bags per acre, though in order to obtain this, picking the seed by hand is often necessary. The bush beans such as Haricot and Canadian Wonder should yield at least five bags per acre and will respond readily to an application of either kraal manure or artificials supplying phosphates and potash. Small acreages of beans often suffer injury from beetles and

other pests. In larger plantings such losses are negligible while the use of labour saving machinery is made possible.

GROUND NUTS.—Similarly with this crop which grows very freely in Rhodesia, given good cultivation, yields of from ten to twenty bags per acre are not uncommon. The demand is seldom met locally and large importations are of yearly necessity. Machinery for reaping, picking and shelling the nuts is procurable, and by means of co-operation between adjoining farmers there is no reason why such labour saving machinery should not be introduced. With ground nuts the danger of glutting the market is reduced to a minimum since when all Rhodesian demands are met there still remains a practically unlimited market in the oil mills of Johannesburg and Durban. Nor are the Railway rates on fifteen ton lots so high as to preclude a profit on exported nuts, being approximately as follows:—

Umtali to Johannesburg	... 2/- per bag
Salisbury to Durban	... 2/10 „
Salisbury to Beira	... 6d. „ (sea freight extra).

Local experience has already proved that the ground nut owing to the luxuriant production of nitro-bacteria nodules on its roots, is the rotation crop par excellence for increasing the nitrogen content of impoverished soils and this alone, apart from its market worth and value as a stock feed, should be sufficient to guarantee its greater popularity. (*For further information, see Farmers' Bulletin No. 23.*)

SWEET POTATOES are one of the crops most easily grown in Rhodesia. The yield is heavy and the demand for the product as food for boys on the mines is usually good. The sweet potato is of particular value on light sandy soils where the labour of lifting is not excessive. It is propagated either from tubers or slips, grows freely, suffers here (as far as we are aware) from no diseases, and in addition to its market value is of great use on the farm for feeding to both cattle and pigs. The potato tops form good grazing, or can be cut and soiled to the stock, while the crop is essentially one on to which pigs can be turned for a few hours a day to forage for themselves. A good average yield of sweet

potatoes is from five to seven tons per acre, which at the lowest estimate should be worth 5/- to 7/6 per 150 lbs.

It is satisfactory to note that the sweet potato is rapidly gaining in popularity among Rhodesian farmers, as evidenced by the increasing number of applications for tubers and slips of the improved American variety.

ONIONS are an extremely profitable crop, but require peculiar conditions. In Rhodesia they are thus far as a rule only grown successfully as a winter crop under irrigation or on naturally moist soil—the seed being sown about March or April, and the young plants transplanted about six weeks later.

The crop requires a rich loamy soil, containing a considerable amount of organic matter, and in this country appears to thrive best on the light alluvial soils of vleis or river banks. A good average yield is, from 50 to 75 bags of 120 lbs. each per acre, but in order to obtain this a generous manuring with dung and artificials is necessary. The variety known locally as the Natal Red usually appears the most satisfactory, and can therefore be recommended. The most important enemy of the crop is onion thrip, and spraying is often necessary in order to keep this pest in check.

The ruling local price for onions is about 17/6 to £1 per bag, and a good average crop may, therefore, give even a better monetary return per acre than will bright leaf Virginia tobacco. (*For further information consult Farmers' Bulletin, No. 57.*)

PUMPKINS.—The methods of growing and handling this crop are already well understood, and pumpkins are fed largely both to cattle, and to pigs in the first stages of fattening. The demand for pumpkins as a marketable product is somewhat uncertain but where contracts can be obtained for supplying adjacent mines the crop can be made a profitable one. Of the true pumpkins the varieties known as "Boer pumpkin" and "Iron bark" are excellent keepers and appear best suited to local conditions, but where stock feed is required the kafir melon known as M'Jorda can also be recommended.

In growing all types of pumpkin and melon the practice of pinching back the runners, which usually increases the production of fruit, is frequently neglected. This process simply consists of pinching out or striking off the growing point of each vine when it has reached a length of about three feet. In Rhodesia pumpkins are often seen grown as a mixed crop with maize, but the system is not to be recommended, since the land is seldom sufficiently fertile to bring both crops to perfection. Cultivation is frequently neglected, and in cases of drought there is seldom adequate moisture in the soil to meet the requirements of both crops. When the crop is planted alone and on manured land returns of fifteen to twenty tons and even more per acre are not uncommon.

LINSEED is rapidly gaining deserved popularity owing to the value of its grain for feeding on the farm. It is one of the most highly priced oil seeds of commerce, and there seems no reason why a remunerative export trade should not be introduced. Should the local production of linseed and ground nuts become of important magnitude, it is believed that oil mills for expressing the crude or refined oil from these seeds could be profitably established. Under existing conditions the local demand for linseed is relatively small, but even at the present time, when grown on a moderately large scale, a crop yielding about three and a half bags of seed per acre could be exported to Dundee at a gross profit of approximately £3 per acre.

Linseed has proved itself specially well suited to the stronger red soils of Rhodesia and also to the well drained black soils, while it thrives well on newly broken land which owing to its raw state would only give a moderate yield of maize. Linseed has long been classified as an exhausting crop, and until the conclusion of some experiments, which are now in hand to prove this point, I am not prepared to express a definite opinion. In any case, however, it might be grown in rotation with bean and other leguminous crops. (*Further information regarding Linseed will be found in Farmers' Bulletin No. 81.*)

CHICORY.—Successful experiments have been carried out with this crop and although the South African market for chicory is limited, there appears to be good money in the crop when grown to contract. It is necessary, however, that

a farmer should be in touch with chicory manufacturers and sure of his market before undertaking the cultivation of this crop on any large scale. Chicory is essentially a crop for light loamy or sandy soils on which the labour and cost of lifting the roots will not be excessive.

On the poorer and lighter soils manuring with dung and artificials is advisable, but the value of the product is sufficiently high to allow of this. Chicory root grown on the Botanical Experiment Station last season on unmanured land, yielded at the rate of two tons of dry chicory per acre. Part of this has been purchased by a Durban manufacturer at the satisfactory price of £17 per ton, landed Durban. The gross monetary return per acre was therefore about £34 from which, when sending to Durban by rail in fifteen ton lots, approximately £10 10s. must be deducted for railage. By exporting by sea *via* Beira the cost could be reduced considerably. (*For further information regarding Chicory, see Farmers' Bulletin No. 88.*)

BOER MANNA.—This crop has long been established in Rhodesia and has recently been proved of value as a rotation crop with maize. In spite of this it is grown by comparatively few farmers. It is a good drought resister, thrives on almost all soils and seldom fails to give a good yield unless sown abnormally late in the season. As a fodder crop it will give from one-and-a-half to two-and-a-half tons of hay per acre, which when cured is excellent cattle feed, while the return of seed which is normally worth about 4d.—5d. per lb., but has recently been selling as high as 9d. per lb., may be anything from 400 lbs. per acre.

Boer Manna is particularly useful for planting on newly broken land which is in an indifferent state of cultivation, and can also be used with advantage as a catch crop in the event of the failure of maize or other earlier sown crops. There is also quite a good opening for growers of manna seed since at present the bulk of the seed sold is imported from the South, and the lowest price at which imported seed can be sold is about 6d. per lb. An acre of manna grown for seed and sold at this price will therefore give a cash return of about £7 10s. to £10.

OTHER SUMMER CEREAL CROPS.—In addition to the forementioned, Teff grass, summer oats and Japanese Millet have been widely tested in Rhodesia with satisfactory results. Teff grass yields a valuable hay which would sell well on local markets. It crops heavily and is suited to all moderately fertile soils while being of especial value as a smother crop for weeds on foul land or as a catch crop. Algerian Oats can usually be grown satisfactorily as a summer crop either on red or black land if sown about the beginning of January, and with even greater certainty if the land is such as to remain moderately moist until the end of June. On still moister soils or with irrigation oats are one of the safest winter crops and are of great value where winter dairying is practiced.

Japanese Millet is a useful summer catch crop for excessively wet and ill drained land. It requires about three and a half months to mature, yields heavily and produces an excellent fodder and a grain suitable for pig or poultry feed.

LEGUMINOUS FODDER CROPS are primarily of value in the rotation as soil renovators, but are also essential if the farmer wishes to feed his stock on a well balanced ration. Where lucerne can not be grown Velvet bean, Cowpea or Soy bean hay are some of the best substitutes and no dairy farmer can expect to keep up the quality of his milk or cream supply unless a certain proportion of leguminous fodder is given in addition to other feed. The Velvet bean can be relied upon with certainty in Rhodesia and is the heaviest fodder yielder of any bean crop, while some varieties of Cowpea and Soy bean, which also do well, are quicker maturing and can better be utilised as catch crops sown about the middle of January.

SUMMER WHEAT.—Reference has not thus far been made to summer wheat, since this crop is not yet past the experimental stage, but it may be said that there are good prospects of Victoria wheat (the variety grown successively for two years in succession on the Botanical Experiment Station) proving a reliable cropper. This wheat is sown on red land about the 1st January, and this season is being sown fairly extensively by several farmers whose maize crops have partially failed owing to drought. The last two season's sowings have yielded at the rate of 5 bags per acre, which, valued at 30/- per bag, represents an acre return of £7 10s.

FIELD CABBAGE.—In the neighbourhood of mines where contracts for a supply of green vegetables can sometimes be obtained, the Drum Head or field cabbage should be a profitable crop, and should be planted on manured land about the middle of January. When young the crop is not infrequently attacked by the saw-fly caterpillar, but the ravages of these pests can be checked by the use of the following spray which is recommended by the Government Entomologist:—

Arsenate of Lead	...	1 lb.
Sugar	...	$\frac{1}{2}$ lb.
Water	...	10-12 gals.

A top dressing of nitrate of soda or sulphate of ammonia will also be helpful, by stimulating the growth of the plants.

Twenty tons of cabbages per acre is a moderate crop, and in order to obtain a succession of mature cabbages successive strips should be set out at intervals of ten to fifteen days. The field cabbage is excellent feed for cattle and pigs, and any surplus can be profitably utilised in this manner.

ROOT CROPS and in particular mangels may also be mentioned, but these are essentially grown for home feeding and will only appeal to those farmers who have cattle or pigs to which to feed the crop. On farms where these conditions obtain root crops are of primary importance. They require liberal manuring—the benefit of which, however, extends over the two succeeding crops, but are in turn consumed on the farm and again converted into manure, so that both stock and lands are beneficially affected.

It is not suggested that every farmer should grow all the crops here enumerated, nor is it desirable since each has its special requirements in regard to soil, time of sowing and methods of handling. By selecting six or seven of those best adapted to the peculiar conditions of each farm a satisfactory scheme of profitable rotation can be evolved, which, without interfering with the main interest of the staple crop, will place the farmer in a better position to take advantage of good prices on local markets, and at the same time to do a certain amount of profitable home-feeding.

It may be instructive to take one or two examples. The first, of a red and black soil farm on the formation with, say,

two hundred acres of red land under maize, in a normal season, yielding eight bags per acre. In order to provide for the rotation, the land may be divided into five blocks of forty acres each (see diagram). In the first year of commencing the rotation, blocks marked on the diagram A, B, C and D will be planted to maize, while block E may be devoted to subsidiary crops as follows:—

Beans for human consumption.	Sown middle of January	8 acres
	Manured with artificials.	
Pumpkins	... Manured, sown early December.	3 acres
Potatoes	... Manured, planted second week January.	4 acres
Sweet potatoes	... Established from Slips, planted between maize the previous year.	2 acres
Linseed	... Sown first week January	3 acres
Boer Manna	... Sown broadcast 1st week January.	10 acres
Velvet Beans	... Drilled immediately after maize.	10 acres

Taking the normal season and presuming the forty acres under maize to yield 8 bags per acre, three hundred and twenty bags will be reaped which valued—for the sake of convenience at 10/- on the farm—equals £160 stg.

Under auxiliary crops this land should yield at the lowest estimate thirty bags of beans, thirty tons pumpkins, two hundred bags potatoes, ten tons sweet potatoes, ten bags linseed, ten tons Boer Manna hay or ten bags of manna seed and ten tons Velvet bean hay for home feeding.

I do not wish to appear dogmatic and shall refrain therefore from making an estimate of the profits likely to be obtained if the forty acres of maize is replaced by these auxiliary crops. Whatever way it is considered, however, I think it must be agreed that all the chances are in favour of increased profits from the rotation crops, while in addition is the benefit derived from a systematic course of rotation.

In the second year block A will come under rotation crops and in the third year block B and so on. Maize is thus grown

A	B	C	D	Sweet Potatoes 2 acres.
				Linseed 3 acres.
				Pumpkins 3 acres.
				Potatoes 4 acres.
				Beans E 8 acres.
				Boer Manna 10 acres.
				Velvet Beans 10 acres.

four years in succession while the fifth year the land is renovated either by manuring or by a leguminous crop, or by one, the decaying stubble of which will supply organic matter. Should the land be insufficiently fertile to stand cropping with maize for four years in succession, a bare fallow might be resorted to in the third year or a crop such as rape, buckwheat or Kafir beans could be sown broadcast; partially fed off and the remainder ploughed under.

If the main interest of the farm is tobacco, maize may be grown in rotation with tobacco (manured) and in addition the following auxiliary crops may be suggested—ground nuts, chicory, potatoes, Kafir beans, pumpkins, beans for human consumption, summer oats and sweet potatoes.

Ephemeral Fever, or Three Days Sickness of Cattle.

By LL. E. W. BEVAN, M.R.C.V.S., Government Veterinary
Bacteriologist.

This disease, which was first observed among cattle in N.W. Rhodesia and was investigated by Government Veterinary Surgeon Edmonds during the latter part of November, 1906, and rapidly spread through Matabeleland and Mashonaland during the early months of the year 1907, has again made its appearance during the past few months. In the previous outbreak the first case recorded in the Salisbury district was on 13th March, while the present outbreak was first noted in that district at the end of February. In 1907, cases occurred at Umtali about the 23rd March, but although the present outbreak has extended from Salisbury to Marandellas, at the time of writing no cases have yet been met with in the Umtali district.

Little is known of the previous history of this disease, but natives have stated that they have met with it previously, and Government Veterinary Surgeon Freer, writing in the *Agricultural Journal* of the Cape of Good Hope, mentions that in the book, *Heart of Africa*, written by Dr. George Schweinfurth about 1867, a disease is described with symptoms identical to those of Three Days Sickness.

The incidence of the disease is remarkable; outbreaks occur in areas far removed from one another, and between which there has been no interchange of stock. During the first outbreak it was thought by many that the locust bird, which was present in exceptional numbers during that season, might be responsible for the transmission of the disease, but such an explanation cannot be applied to the present epidemic. Cattle of all ages, of both sexes, in high and low condition, are equally susceptible; trek oxen, cattle at pasture and milch cows suffer alike. No

particular breed of cattle appears to possess any immunity : the native cattle of Mashonaland and Matabeleland, as well as imported animals from the Southern territories and from the North, and recently imported animals from Great Britain are subject to the disease. Cattle salted to red-water, Anaplasmosis and African Coast fever possess no immunity. Animals known to have contracted the disease in 1907 have suffered again during the present year. Fat animals and bulls appear to suffer more severely than those in low condition, but the disease is by no means peculiar to fat animals.

The disease makes its appearance suddenly in a herd, and it is then noticed that within the first day or two quite a number of the animals become affected ; it appears to originate spontaneously. For this reason it has been suggested that a peculiar condition of the pasture or of the atmosphere may be responsible, but although these may play a part in the occurrence of the disease, they are by no means the only factor. It has been noticed in the Cape Colony that stabled animals suffer from the malady, and a case has recently occurred in a bull which was closely housed and fed on certain dry foods which were brought to it, with a view to testing their feeding values. Now, it is known that the specific cause of the disease is present in the blood of the sick animal, and during the 1907 outbreak the writer sent a quantity of such blood preserved in a bottle to Mr. W. Robertson, of the Grahamstown Laboratory, who inoculated the same into the jugular vein of an ox which developed the typical temperature and characteristic stiffness of the limbs. This experiment was repeated by several observers with similar results, and the period of incubation is now known to be from two to three days. The attack so conferred is followed by an immunity lasting for at least six weeks, but the blood of a recovered animal does not produce the disease if taken when all the symptoms have subsided. Nevertheless the incidence of the disease would give rise to the suspicion that the specific organism is present in bovines, producing no ill effects in them until some unusual conditions reduce the tolerance or immunity of the animal. An analogy to this is met with in the well-known tolerance of fly-struck cattle to *trypanosomes*, until exposure to heavy rains breaks down their immunity, often with fatal effects. It has been

suggested that the transmission of the disease in nature is through the agency of night midges, and such an explanation would account for those cases which occur in stables and in towns.

SYMPTOMS.—As the popular name “Three Days Sickness” suggests typical cases of the disease run their course in about three days, but in complicated cases the symptoms may persist for weeks. On the other hand, acute cases have been known to recover in 24 hours. At first the disease was given the name of “Stiff Sickness” because the prevailing symptom encountered was stiffness. The confusion, however, between the three days sickness and the stiff sickness, or “Lamziekte” of cattle, due to the eating of a plant *Crotalaria Burkeana* or “Stijfziekte Bosje” has rendered it desirable to avoid the term.

The stiffness may be noticed in one or more legs. It may involve one or both fore legs or one or both hind legs. A fore limb and a hind limb may be simultaneously affected, or all four legs may be stiff at the same time. The stiffness may rapidly pass from one limb to another, and it has been observed that a trek animal will pull up lame in one limb and move off lame in another. The stiffness may involve the muscles of the neck or back and when the former are involved the animal stands in a very characteristic attitude, with its head protruded and sometimes with its lips drawn to one side. When the neck and throat are affected, the muscles which take part in the act of swallowing may be involved, and it is due to this fact that the dosing of sick animals is often attended with disastrous results in that medicines pass down the wind pipe instead of down the gullet. It is often possible to determine, even when the animal is lying down, the part of the body affected, by the extraordinary manner in which small flies settle on the part; and Government Veterinary Surgeon Rowland Williams has described a hardness and swelling of the skin over the affected area. Very frequently a ropy saliva hangs from the lips and a discharge pours from the nose. The animal frequently grinds its teeth and groans, and when lying down allows its head to fall to its side. During the first day of the sickness the beast neither feeds nor ruminates. The return of appetite and chewing of the cud may be taken as a sign of

recovery. A noticeable feature is the swollen appearance of the tissues around the eyes, giving the animal a dull, heavy appearance. This swelling and severe lachrymation with a temperature often elevated to 107° F. may be the first indication of the disease. In the majority of cases constipation is met with, the dung being hard and dry, and often covered with a coating of mucus.

The mortality from the disease is very small, and it is therefore difficult to state what are the lesions proper to it as distinct from those due to complications. In experimental cases the lymphatic glands are often enlarged and more juicy than normal, while a slight reddening of the mucous membrane lining the stomach and intestines is met with. As far as this country is concerned, it was noticed in the first outbreak and it has been observed again in the present epidemic, that animals which have recovered from the disease do not suffer a second time, although this opinion is not held by veterinary surgeons in Cape Colony. In a few instances, after apparent recovery, the animal has succumbed from the after effects, the most common of which is pneumonia. This malady has been described as the "Jazy man's disease" for the reason that the best treatment is undoubtedly to leave the animal alone. When the disease first occurred anxious stock-owners sought for a remedy and poured gallons of extraordinary fluids into their sick animals. Unfortunately, for the reason before stated, these delectable mixtures often passed "down the wrong way" and killed more than they cured. The sick animal should be trussed up on its middle and, if possible, should be dragged into the shade and given a supply of fresh water. Beyond use of soap and water enemas, no other treatment is required; G.V.S. Williams has found a six drachm aloetic physic ball a useful purgative. Recovery is often as rapid as the onset of the disease.

The first case on a property might be difficult to diagnose and it is always advisable for blood and gland preparations to be submitted to the Veterinary Department in order that other more dangerous diseases may not be overlooked.

School Floral Fete.

A Floral Fete, the main portion of which will be a flower show, is to be held in September at Salisbury. Every encouragement is given to the growing of flowers, which may be expected to bloom at that time of the year. The main objects of the fete are to incite winter cultivation of gardens and to induce children to become horticulturists. If it were only for the sake of relieving the bleak bareness of the ordinary gardens during the winter months, the object is a worthy one, but it would also be highly instructive. Winter cultivation for one thing has far fewer drawbacks than cultivation in the summer. There is not the same perpetual fight with insects, and all the pests of lower animal life, nor is any damage to be expected from torrential rains. Cultivation, and in particular, watering, is completely under control. There, of course, may be damage from frost, but the frost is rarely excessive and it is easy to make a selection of plants which can withstand the little we get. As for the second object—the encouragement of youthful gardeners, we can imagine that this is a crafty method of instilling the first principles of agriculture in the young mind in the most attractive form. The ground principles of horticulture and agriculture are the same, and if the principles are taught by the most fascinating and the most easily controlled method a great good is being done to the country at large. The lack of water is usually thought to be an insuperable difficulty but after all it does not require a great extent of land to produce good flowers, and on the other hand it will be found that if the ground is properly prepared and properly protected, much less water will be required than is usually thought to be the case. If the ground is well manured so as to make it light and easily permeable by water, one soaking every three or four days will be enough. The necessity for water must not be judged by the drooping of plants in the hot sun, but by their appearance in the morning. Plants which look fresh and vigorous while in the shade may sometimes immediately

the sun shines on them show a thirsty appearance but this does not indicate want of moisture below. It is a good plan to prevent the surface soil from getting caked to cover seed beds with grass, and in the case of growing plants to surround them with well-rotted manure lightly dug into the soil.

The September fete is being organised by Mr. G. Duthie, Director of Education, who has all along shown himself in keen sympathy with the agricultural development of the country. The schedule which is presented in a form much more handsome than the usual flower show schedule, has been distributed broadcast and if any farmer has been inadvertently overlooked a copy may be had from Mr. Duthie, Box 389, Salisbury. In it will be found a long list of tempting prizes. A special feature is to be made of sweet peas, and there is a handsome rose bowl, valued at £7 10s., presented by Messrs. Mitchell and Liddle, for table decorations with this flower. This is an opportunity for those who are not advanced enough in horticulture to produce large blooms, but still can grow presentable blooms for colour. There is a £5 cash prize for amateurs and professionals, presented by the Editor of *South African Gardening*, for one branch of ten stems of sweet peas, and to give those at a distance an equal chance with residents in Salisbury, all the bunches have to be posted the day before the show.

Messrs. G. H. Williams & Co. offer a £5 5s. cup for the best six bunches of sweet peas grown from the seed supplied by them, and there is a gold medal for a similar number of bunches grown from any seed. There is also a unique competition which will enable growers to exhibit the largest blooms they have grown at any time previous to the show. All they require to do is to press the blooms and despatch them so as to arrive in Salisbury on Thursday, two days before the show and they will be judged entirely by size of bloom and length of stem.

The first blooms of roses ought to be in good condition on September 21st, judging by last year, and prizes are given for these, as also for carnations, violets, pansies and pot-plants of palms, ferns, flowering plants, foliage plants, geraniums, etc. It is usually farmers' wives who look after the flower garden and the verandah, and they will have plenty of

scope for their favourite employment during the coming winter, but they can also try their hand at cakes and sweets and marmalade and so forth, and they stand a chance of winning a £1 prize for first place and a 10s. prize for second place for each of these exhibits.

The children too have not been forgotten. Of course, they may compete in the grown-up sections, but they have special classes of their own for sweet peas and other flowers, and for vegetables. A specially interesting and useful section for boys is that for the best article of furniture made out of packing cases. The desirability of training the youth of Rhodesia in economy and adaptability are obvious.

But the fete is for school funds. It is generally known to what excellent purpose the school funds already collected have been put. Valuable reproductions of world-renowned pictures adorn the walls of the schools, but there is much more that can be done in this and other directions, so as to bring before the children those things which are educative in the highest sense. To obtain additional funds, Mr. Duthie claims all the exhibits, with the exception of pot plants, as his, to be sold by auction at the end of the show. In return for this, however, exhibitors will have no trouble about entrance fees or sending entries beforehand, except in the case of table decorations, where it is necessary to know the number of tables to provide. All conditions may be seen in the schedule, which may be obtained as already mentioned.

Statistics.

SOUTHERN RHODESIA IMPORTS.

We have abstracted from the *British South African Trade Journal* the following particulars of products imported into Southern Rhodesia during the twelve months ended, December, 1911:—

ARTICLE.	South African Produce.		Not South African Produce	
	Quantity.	Value.	Quantity.	Value.
	lbs.	£	lbs.	£
Butter	288,241	20,209	61,143	3,847
Cheese	22,177	855	182,947	6,196
Maize	2,915,102	7,241	681,887	1,449
Oats	968,405	2,695	11,356	49
Wheaten Meal and Flour ...	3,408,099	20,690	5,122,209	25,934
Other Kinds ...	1,906,268	5 450	473,407	2,707
Eggs	1,714,536	9,489	225,630	916
Fresh Fruit ... (including nuts)	—	15,947	—	3,850
Meats, fresh, frozen, preserved (including bacon and hams)	959,652	15,220	1,187,173	41,829
Condensed Milk	—	—	855,614	16,737
Rice	—	—	3,218,704	15,630
Potatoes ...	528,639	2,071	555,749	1,962

It is perhaps interesting to note that potable spirits to the value of £66,342 were imported into the territory during 1911, of which amount £11,114 represented South African produce.

The total value of exports from Southern Rhodesia during 1911, less gold and diamonds, was £553,289. Imports, less specie amounted to £746,277.

NYASALAND.

For the period April 1st, 1911, to January 31st, 1912, Nyasaland exported 2,144,667 lbs. of tobacco valued at £53,640; 1,233,333 lbs. of cotton valued at £40,871; 731,882 lbs. of coffee, valued at £15,247; and 142,113 lbs. of mica, valued at £6,575. The total exports for the period mentioned excluding specie (£10,215) amounted to £140,831, an increase of £19,127 over the corresponding period.

ORANGE FREE STATE.

PRODUCTION OF BUTTER DURING 1911.

During the year 1911 the several creameries of the Orange Free State turned out 3,056,244 lb. of butter, valued at £189,858 12s. 11d. The total cream produced at 40 per cent. average amounted to 2,827,463 lb., valued at £141,373 3s.; 468,170 gallons of milk were sold for local consumption, valued at £15,605 13s. 4d.; 248,032 gallons of fresh milk, worth £8,184 9s. 8d., were sent out of the Free State; whilst the value of milk for cheese production and of cheese manufactured amounted to £454 6s. 8d. and £85 17s. 6d. respectively. Of skim-milk at 90 per cent. 6,876,549 gallons were produced, valued at £3,581 10s. 8d.; whey at 85 per cent., 11,585 gallons, worth £6 0s. 8d.; and butter-milk, 4,584,366 gallons, valued at £2,387 13s. 9d. The quantity of cream at 40 per cent. average sent out of the Orange Free State was 76,843 lb. These figures do not include goats' milk, milk used on farms for domestic purposes, or feeding of calves; and the figures relating to butter production do not include home-made or farm butters made for sale or domestic purposes.

TRANSVAAL.

The output of tobacco from the Union during the coming season is estimated at just upon 7,000,000 lbs., the Transvaal being the main source of supply.

Dairying.

ADVICE TO FARMERS.

All Danish creameries circulate amongst their members sets of rules for the general treatment, feeding, and milking of milch cows. One sees copies of these rules, which are printed in large type on thick cardboard, hung in every cow bail. They contain instructions for milking, and it would not be out of place here to repeat the "good advice."

"MILKER, MARK THIS WELL."

- 1.—The cow is a living machine.
 - (a) Kindly treatment entails less labour, and gives more milk.
- 2.—Good work improves the living machine.
 - (a) Milk clean. Clean milking develops the udder, and with this increases the quantity of milk, and
 - (b) You receive richer milk.
 - (c) Remember that the milk last drawn is by far the most valuable.
- 3.—Clean milking.
 - (a) You should wear tidy and clean clothes.
 - (b) Have the milk pail clean as well as the creamery can.
 - (c) Thoroughly clean the udder by rubbing with a piece of linen.
 - (d) Wash the hands thoroughly before milking.
 - (e) Let the udder be quite dry before you begin to milk.
- 4.—Carry out the work properly.
 - (a) Milk with dry hands.
 - (b) Seize the teats with the whole hand.
 - (c) Keep a gentle pressure on the udder.
 - (d) Milk as fast as you can, and never cease working until the milk is wholly drawn.
 - (e) Don't strain the teat beyond its natural length.
 - (f) Remember the value of the last drops.
- 5.—Healthy state of the udder.
 - (a) If there be soreness or lumps in the udder or teats, stoppage in the milk canal, or unnatural coloured milk, don't mix the milk with any other, and don't send to the creamery.
- 6.—Milking times.
 - (a) Begin milking always at fixed times.
 - (b) Milk the same cows in the same order.
- 7.—Regard this excellent work as one of honour.

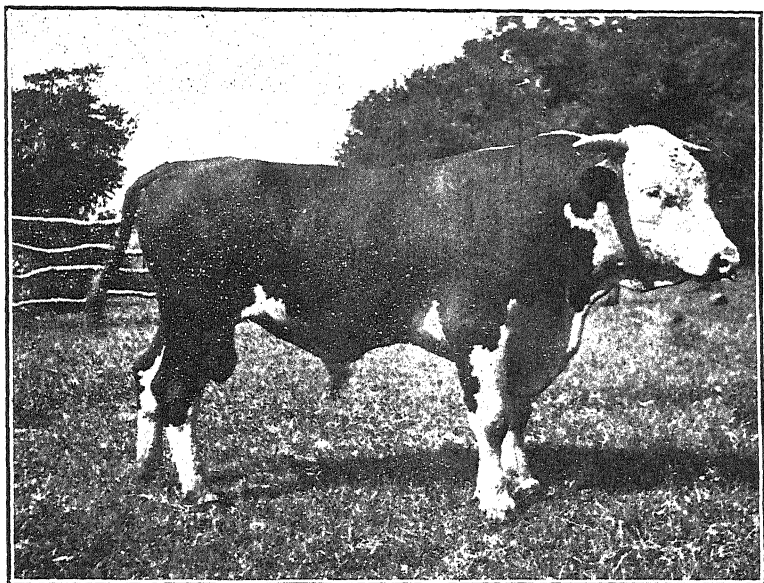
"FARMER, MARK THIS WELL."

- 1.—Clean the cows.
- 2.—Have good air in the stalls.
- 3.—Light should be freely admitted.

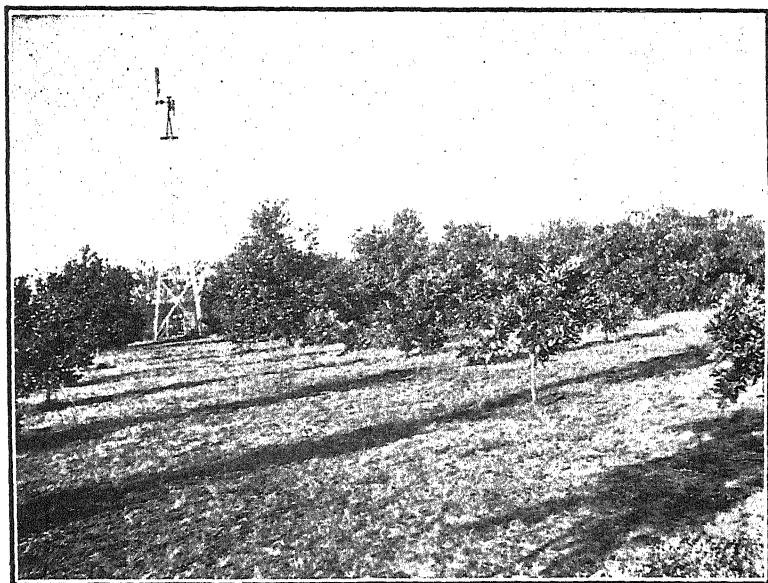
Reviews.

"LIST OF IRISH EXPORTING MANUFACTURERS, 1911."

We have received from the Secretary of the Department of Agriculture and Technical Instruction for Ireland a "List of Irish Exporting Manufacturers, 1911," a neatly bound volume, issued by the Department in response to many requests for information as to Irish firms who manufacture, or who are prepared to manufacture goods suitable for foreign trade. The book is printed in five languages, viz., English, French, German, Spanish and Italian, and the object of the publication, as explained in the introduction, is first of all to facilitate the opening up of new markets for Irish products; secondly, to materially assist foreign buyers to get into direct touch with the producers in Ireland. It is claimed that Ireland annually produces a large quantity of goods of the most varied nature, some of which have attained a world-wide reputation, the importance and good quality of which are, however, too frequently lost sight of owing to the fact that the great bulk of the Irish foreign trade is done through the large British ports. This means that the foreign buyer is often unaware of the true origin of the goods, and the Irish produce consequently loses a certain amount of prestige in the world-market, besides failing to get into direct touch with and to ascertain the exact requirements of his foreign customers. The book will go a long way towards remedying this state of things and will, therefore, be welcomed by every patriot.



"Lawton 2nd," Hereford bull, the property of Messrs. Beamish Bros.,
Nyamandhlovu.



Citrus Orchard, Hilda's Kraal, Nyamandhlovu.

Hints about Pruning Deciduous Fruit Trees.

By HERMON BROWN, Curator, Public Gardens,
Salisbury.

Pruning is such a large and important question that it is impossible in a small article to anywhere near cover the whole subject, so it is best to take certain things for granted as the best orchardists and fruit growers are generally of one opinion in regard to certain principles. My object now will therefore be to endeavour to try to explain how to reach these certain ideals. These ideals are of course modified by different habits of growth, season, soil, water, etc. The ideal tree is a low-headed stocky tree with an open centre with the fruit bearing wood along the main limbs and evenly distributed over the whole tree. To attain this ideal we will start with the tree as it is received from the nursery.

Most trees, as received, are one or two years old from the bud. This can easily be told by the look of the wood. Wood of one year old shows a leaf bud at the base of each leaf or where a leaf has been; if the tree has branched there will be a well developed bud at the base of the limb.

When the one-year-old tree is planted and there are found to be well-developed buds all the way up the stem from the ground, I would cut the top off 24 to 26 inches from the ground, and if there are limbs, I would cut them away, taking care though not to injure the bud or buds at their base.

If the tree is a two-year-old and well branched, it should also be cut back 24 to 26 inches, but instead of cutting the limbs clear away, they may be cut to spurs, leaving two or three buds on each.

Now, if these trees are treated as above and properly protected and watered they should start a growth from every bud, and as soon as they have grown an inch they must be gone over. Every bud coming from the stem less than 12 inches from the ground should be rubbed off with the fingers. Of the other growths there should be left six or eight well distributed on the top, and it is better for no two to be exactly opposite.

If for any reason the tree should make a poor growth and only one or two buds start, or the top should die, then leave only one bud and that the lowest, but be sure it is above the graft, as the head can be formed the next year as if it was just planted.

At the end of the first year you should have a sturdy little tree with six or eight limbs, and as soon as the tree is perfectly dormant and the leaves have fallen, it is ready for pruning. If the tree has made a good growth, the limbs should be three or four feet long. Now you must look at your tree and decide upon three, four or five limbs to carry on the growth of your tree. (I prefer four). These should be well distributed up and down the trunk and as far apart as possible and no two exactly opposite. The choice of these limbs is very important as it is the foundation of your tree, and I particularly warn you not to leave more than five limbs and no branches. These limbs should be cut back about 12 inches from the main stem, and if the tree is of a very spreading habit, you should have the terminal buds on the inside—otherwise cut to outside buds.

If for any reason your tree makes a very weak growth and it is not over a foot long, choose your main limbs as before, but cut back to near the trunk, leaving only two buds to each limb.

The next year your tree should make a strong growth, and each of your four limbs (if four were chosen) will send out perhaps half-a-dozen or a dozen limbs each. This is as it should be, and if the buds near the ends of the limbs are making the strongest growth they will need very little attention; but if the terminal buds are not making the strongest growth you may need to pinch off the tips of some of the lower stronger buds which seem to be taking all of the strength. This will encourage the end buds which are to carry on the growth of the tree.

Thus far you can treat nearly all deciduous trees alike but the next pruning you must consider the habit of the tree and how the fruit is borne. If it is an apple tree and your conditions are similar to those obtaining in Salisbury, you will have little more pruning to do. Some limbs that grow too fast may need heading back, and if some limbs are too close together or crowded they may need taking out altogether, but that is about all the pruning the tree will need.

If it is a peach you will continue the growth by leaving two of the strongest terminal limbs, taking care not to form a crotch, and these two limbs should be cut back to about a foot in length taking care to cut to inner or outer buds, as the tree needs spreading or closing. Instead of cutting away all of the other limbs they should be cut back to three or four inches long, cutting away altogether only when they are too crowded. I would not leave them nearer than three or four inches apart. These short limbs should be nursed and cared for,—one year cutting back; another, thinned and headed back to bear fruit. Peaches bear fruit on the wood that grew the year previous, so one must treat these short limbs so as to raise new wood for next year's crop and also leave enough to bear fruit this year.

If the tree is an apricot or a plum it must be pruned much the same as a peach, only the apricot and plum bear fruit on spurs which may be one or five years old. These spurs must be well cared for. If they are getting weak they must be cut back harder, but if too strong, they must be left longer so as to carry more fruit. Always keep them bearing as close to the main limb as possible. Your pruning each year after this will be to carry on your main limbs not over twelve inches in one year, but as your tree reaches maturity it may be much less. I have seen apricots that had not more than two inches extension in a year. Never more than double your main limbs in one year and avoid crotches as much as possible. Care for your short fruit spurs and branches and develop spurs on each year's growth. This means annual pruning, otherwise you will lose spurs on one season's growth and in the case of apricot and plum you will have the one year bare. In cutting, cut to a plump bud that is pointing the way you want the tree to grow.

When you cut a limb or a spur away, cut close, very close, even into the swelling next to the limb, as it heals sooner. If a stub is left where you cut the end of the limb last year, always cut it back close when you prune this year.

The great tendency is to leave too much wood when the tree is young, consequently it comes into bearing early, overbears and stunts itself. The result is a stunted bush when you want a tree. The owner is no doubt pleased when his little trees bear so well, but by the time the tree should be a good size and in full bearing, he finds he has a little tree occupying about six feet of ground when it should occupy twenty.

Preparation of Blood Smears.

The following information regarding the preparation of blood smears is issued for the information and guidance of stock owners.

The diagnosis of several diseases of stock in South Africa is easily made by means of an examination of blood with the microscope. This is especially the case in African Coast fever, redwater, anthrax, biliary fever, some forms of gall-sickness and other diseases. It is therefore advisable when an animal is suffering from a disease to take some of the blood and forward the preparation to the Government Veterinary Bacteriologist, Salisbury. Special envelopes and glass slides can be obtained on application to the Veterinary Department. The accompanying directions should be observed in order to make a good blood smear, which is essential for accurate diagnosis.

BLOOD FROM THE LIVING ANIMAL.—Blood may be taken from one of the veins which run along the upper circuit of the ear. The animal's head should be firmly secured, and the ear thoroughly cleaned. A prominent vein should then be pricked with a needle (an ordinary clean sewing needle will do) or with the point of a clean sharp knife, or a fine incision can be made on the margin of the ear. As soon as the blood flows the smear should be made; if delay occurs in spreading the film the blood will coagulate and the smear be a failure. Do not squeeze the vein in order to make the blood flow; the flow should occur quite naturally. Blood smears should be taken from the uppermost ear of the dead animal, from the spleen or lymphatic glands, and in the forwarding letter it should be stated from which organ the smear was made. Cut the organ with a clean knife and scrape a small piece of the cut surface off with the edge of the glass slide.

TO MAKE A BLOOD SMEAR.—The first thing to be done is to prepare the glass slides on which the blood is to be spread.

The glass should be thoroughly cleaned, kept free from dust, and should be polished with a cloth or handkerchief immediately before use. A number of slides may be cleaned at one time by boiling in a solution of Hudson's soap powder and afterwards rinsing in clean water. These should then be kept wrapped up in paper ready for use. To make the film a very small drop of blood about the size of a milletseed should be put on one end of the slide by means of either a small piece of clean dried grass, or by the point of a knife, or by the needle used for pricking the ear, or by one of the corners of another glass slide. A second slide should be placed over it, arranging that the two slides together form an acute angle wherein the blood drop lies; the inclined glass slide should touch the blood drop, and the blood will then run along the edge of the slide, and the inclined slide should then be immediately pushed along the horizontal slide when the required thin film of blood will result.

Scrapings from the organ, made with the short edge of the slide, can be pushed over the horizontal slide in the same manner.

It is very easy to spoil a smear by making it too thick, and the film should always be made as thin as possible. A rough way to ascertain whether the blood film is too thick or not is to hold the slide with the blood smear on it up to the light, and if the colours of the rainbow can be seen on the glass the film can be considered as being thin enough.

When the smear has been made, allow the blood on the glass to dry in the air, but not in the direct sunlight. When the blood is dry wrap each glass in a small piece of thin paper before placing in the envelope.

If an animal is suspected to be suffering from quarter evil, the diagnosis can be confirmed by examination of the smear made from the juice of the swelling.

Special reference has been made in this Journal to the value of gland punctures in suspected cases of African Coast Fever.

The diagnosis of African Coast Fever may be based on (1) the presence of the parasite (*Theileria parvum*) in the red

blood cells, (2) the so-called Koch's bodies in the glands, spleen and other organs.

While other parasites closely resemble *Theileria parvum*, Koch's bodies are diagnostic of African Coast Fever, and being an early stage in the life circle of the parasite are met with in the gland and spleen some days before *Theileria parvum* can be detected in the blood.

It is often of the greatest importance that an early decision shall be arrived at as to whether an animal is suffering from the disease, and valuable time may be saved by forwarding gland smears as well as blood smears for diagnosis by microscopic examination at the Veterinary Laboratory, Salisbury. The operation is comparatively simple. The animal having been secured against a fence, the head should be drawn round towards the operator, who stands on the left side, and seizes with his left hand the large gland in front of the shoulder. The hair over the gland is removed and the area is washed with an antiseptic and dried. Holding the gland firmly imprisoned under the skin, the operator introduces the needle of a hypodermic syringe into it from below, upwards, and attaching the barrel of the syringe draws up the gland juice by withdrawing the piston. For this purpose it is advisable to use a needle having a large bore. With some animals it is somewhat difficult to manipulate the syringe single-handed, and it may be found easier to attach a piece of rubber tubing to the needle exerting suction from the mouth.

If the animal is too wild or restless it may be necessary to throw it and to operate upon the gland of the flank which lies slightly above and in front of the point of the stifle.

The substance removed should then be placed on a clean microscopic glass slide and spread after the manner of a blood film. The wound should then be washed with antiseptic, and should heal rapidly.

When no apparatus is available very little damage is done by cutting boldly into the gland and removing some gland substance by scraping with the point of the knife.

Notes from the Agricultural Laboratories.

CHEMICAL.

COMPOSITION OF NATIVE GRAINS.—Samples of Nyouti (*Pennisetum spicatum*) and Rapoko (*Eleusine coracana*) recently examined gave the following results :—

				Nyouti. (Lab. No. 188)	Rapoko. (Lab. No. 190)
				Per cent.	Per cent.
Water	...	...	...	9'42	10'58
Fat (Ether extract)	...	...	...	4'31	1'30
Protein (total Nitrogen X 6'25)	...	...	...	11'37	7'62
Carbohydrates	...	...	...	71'15	74'46
Fibre	...	...	...	1'57	2'88
Ash	...	...	...	2'18	3'16
				100'00	100'00

Assuming that the two grains are of equal digestibility, Nyouti has a higher feeding value than Rapoko, being richer in the flesh-forming constituent protein, and in fat. Nyouti is similar to maize in composition.

WOOD ASHES.

The composition of the ash of woods is extremely variable. This is to be noted not only in different varieties of trees but also in the same variety, the twigs and bark yielding an ash differing considerably in composition from that produced from the wood itself. For agricultural purposes, the valuable constituents of wood ashes are lime, potash and phosphoric oxide. The amounts of these ingredients in a sample (Lab. No. 105) recently examined were as follows :—

				Per cent.
Lime (Calcium oxide)	...	...	...	18'37
Phosphoric oxide	...	...	...	4'72
Potash (Potassium Oxide)	...	...	...	1'10
Carbon dioxide	...	...	...	12'06

This sample had been exposed to the action of the air for at least fifteen months previous to analysis, consequently a portion of the lime had absorbed carbon dioxide from the air to form calcium carbonate (mild lime). The percentage amount of phosphoric oxide in the sample is higher and of lime and potash lower, than is usually present in wood ashes.

In 97 samples of ashes from American woods the maximum and minimum amounts of lime, phosphoric oxide and potash were as follows:—

			Per cent.	Per cent.
Lime	...	...	18'0	50'9
Phosphoric oxide	...	...	0'3	4'0
Potash	...	...	2'5	10'2

The lack of uniformity in the composition of wood ashes will therefore be appreciated.

Applied in adequate dressings, wood ashes in a fresh state are more suited for use on heavy soils rich in vegetable matter than on those of a light character, the reason for this being that in fresh ashes most of the lime is present as quicklime or slaked lime, in which forms it has a powerful action in promoting the decomposition of organic (vegetable) matter, the excessive loss of which is very detrimental in the case of light soils. Ashes which have been allowed to stand exposed to the air for some time, *protected from rain*, are more suitable for light land because the bulk of the lime will then exist as carbonate, and carbonate of lime is much milder in its action. On heavy soils, poor in lime, fresh wood ashes applied at the rate of 10-20 cwts. per acre, should prove very beneficial.

G.N.B.

Correspondence.

INYANGA WOOL.

THE EDITOR,

RHODESIA AGRICULTURAL JOURNAL.

Sir,—In your issue of February, which I have just received, you have a report on the wool sales from Inyanga, which is of extraordinary interest to me, because, having been a fairly successful wool farmer in the Eastern Province of Cape Colony, it shows one of two things. Either Inyanga is most hopelessly unsuited to the Merino sheep or there is terribly bad handling of the wool.

Now, from what one hears of the Rhodes' Estate, I do not think that the second can be the reason for the very poor prices, therefore it must be the first, which is the conclusion I have held ever since I first heard of the climate at Inyanga.

Only consider for a moment the origin of the Merino sheep! It came from the arid districts of Spain and was acclimatised to the drier parts of Australia and Cape Colony, and from its constitution and growth of wool, is most unsuited to a misty climate. In the Stutterheim district of Cape Colony, where I was farming, it was perfectly well known that the higher parts, where there was mist during a larger part of the year, were unhealthy for Merinos, except during the very driest months.

The experience of the district I speak of is one to be considered, as we prided ourselves on getting the highest prices in South Africa for our wool. I, myself, once received 1s. 0½d. for my Hoggetts wool and never less than 10½d. This was for wool in the grease sold in South Africa, which, supposing that it yielded 50% of clean wool, which it certainly did not, nor have I ever heard of any wool yielding such a high percentage, would mean twenty-five pence for my record or twenty-one pence for my lowest. Therefore fourteen pence in London, after paying all charges, is a very poor price.

Anyhow, it is a most foolish practice to scour decent wool at this end. Scour the bellies and locks certainly, because the manufacturer divides it up and classes it along with other purchases, according to qualities, which few wool growers here are competent to do, and if they did, the separate qualities would be in such small quantities each that the cost of handling would be excessive.

I am firmly of opinion that, though I have been but a short time in the country, the greater part of it is quite suited to the Merino sheep.

I am, etc.,

G. H. GORDON.

Banket Junction, March 11th, 1912.

Market Reports.

APRIL 1ST, 1912.

SALISBURY.

The market continues to be well supplied with grain, but monkey nuts and beans are unobtainable in Mashonaland. The new crops are expected to be very short, and high prices may be looked for throughout the next season.

There is a keen demand for breeding stock, which is practically unobtainable. Enquiry for mules and donkeys is fairly brisk.

BULAWAYO.

There is a fair supply of mealies on hand, at prices which are ruled by the Union market, whence the bulk now comes. Some of the consignments on offer, however, come from Salisbury. The continued drought, of course, intensifies the poor outlook for the new season, the harvest of which is not likely to reach over 30 per cent. of the average for this part of the country. Kafir corn, inyouti, rapoko and beans are still unobtainable. Vegetables are very scarce, though carrots, and also lettuce, look like becoming more abundant. Fruit is getting scarce.

The cattle market is quiet. There is an unusually keen demand for milch cows, but animals that come on offer are just now few and far between. A few sales are recorded in trek oxen, but no Zambesi stock is obtainable. Trade in horses is practically stagnant, and is generally explained as being chiefly the result of the tightness of money. Purchasers of mules will only deal with inoculateds, and owing to a rising price in the Colony prices here are becoming dearer. Numerous enquiries for colonial heifers have been received, but cannot be met, the principal districts in the Cape whence these come having been closed on export in consequence of the prevalence of African Coast fever,

KIMBERLEY.

Oathay, oats and onions are very firm; maize is slightly easier; butter is cheap; eggs are in good demand and vegetables and fruit are selling well.

FOREIGN MARKETS.

A parcel of South African white flat maize, No. 2 grade, in bags, was sold recently in the Baltic Saleroom at 30s. 3d. per quarter for March to the 15th April shipment to London. The maize market generally has been firm on unfavourable weather advices.

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Barley, per 150 lbs. ...	9/6 11/6	(163 lbs.) 9/0 11/0	—	30/0 32/6
Beans, per 203 lbs. ...	21/0 29/0	—	Green, per tray 4/0 7/0	40/0 45/0
Beans, Sugar	—	24/6 32/6	—	—
Beans, kafir, per 203 lbs.	—	20/0 24/0	—	30/0 40/0
Boer Meal, unsifted, per 200 lbs. ...	—	20/6 20/9	42/0 43/0	42/6 45/0
Bran, per 100 lbs. ...	5/6 6/3	5/6 5/9	14/0 14/6	15/0 16/0
Flour ...	—	—	25/6 26/6	19/0 25/0
Flour, Colonial 100 lbs.	—	13/0 14/0	22/0 22/6	20/0 24/0
Forage, 100 lbs. ...	3/0 4/9	4/6 4/9	10/6 12/0	—
„ Colonial Oat ...	—	—	—	10/0 11/0
Hay, per bale ...	6d. 1/0	—	per ton, 65/0 80/0	35/0 40/0
Kafir Corn, White, per 200 lbs. ...	15/9 16/3	14/6 16/6	—	—
Manna, per 100 lbs. ...	2/0 2/3	—	—	6/0 7/0
Mealies, S.A., White per 200 lbs. ...	9/6 11/0	12/6 13/0	19/0 20/0	15/0 16/0
Mealies, S.A., Yellow, per 200 lbs. ...	8/6 10/9	12/6 13/0	17/6 18/6	—
Mealie Meal, White, per 200 lbs. ...	15/3 22/6	(183 lbs.) 12/6 13/0	—	17/6 18/0
Manga, per 200 lbs. ...	—	—	—	—
Monkey Nuts, per bag	—	—	18/6 19/6	—
Oats, per 150 lbs. ...	6/6 9/0	10/0 10/6	20/0 20/6	22/0 24/6
Onions, per 120 lbs. ...	7/0 10/3	6/0 8/6	17/0 18/0	21/0 23/0
Peas, per 200 lbs. ...	14/0 21/9	—	—	—
Potatoes, per 150 lbs. ...	3/0 7/6	7/6 15/0	—	12/6
„ New	9/6 12/6	14/0 18/0	23/6 25/0	25/0 27/6
Rapoko ...	—	—	—	—
Rye, per 200 lbs. ...	9/0 11/0	—	—	15/0 16/0
Salt, per 200 lbs. ...	—	—	10/6 11/6	—
Tobacco, good, per lb	—	—	—	—
„ inferior, per lb	—	—	—	—

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Wheat, per 203 lbs. ...	12/0 16/3	16/0 18/6	—	25/0 27/6
Butter, per lb. ...	9d. 1/3	10d. 1/0	1/0 1/6	2/0 —
Butter, second quality	—	—	—	—
Eggs, per doz. ...	1/6 2/3	1/3 1/9	2/6 4/0	4/6 5/0
Ducks, each ...	1/6 3/0	2/6 3/3	—	4/0
Fowls, each ...	1/6 2/6	1/3 2/3	1/4 2/3	3/6 5/0
Geese, each ...	—	—	—	12/6
Turkeys, each ...	5/6 16/0	4/6 8/0	—	17/6 £1

LIVESTOCK.

Horses ...	£9 £25	£10 £25	£20 £40	£25 £30
Mules ...	£10 £30	£18 £25	£31 £37/10	£23 £28
Donkeys, geldings ...	£6 £7/15	£5 £7	£7 £8/10	£7 £8
„ mares ...	—	£6 £7/10	£8/10 £10/10	£9
Cows, Dairy ...	—	—	£25 £35	—
Cows, Native ...	—	—	£7/10 £9/10	£9/10 £10/10
Oxen, Trained ...	—	—	£8/10 £11/10	—
Cows, Slaughter ...	£7 £10	—	—	—
Oxen, Ordinary ...	£7/15 £9	£8 £9/10	—	£9 £10
Oxen, good ...	£10 £13/10	£10 £13/10	—	£10 £11
Oxen, medium ...	£8/10 £9/10	—	—	—
Calves, ...	—	£2 £3	—	—
Heifers, Colonial ...	£5/15 £7/10	—	£8 £17/10	—
Heifers, Native ...	—	—	—	£6 £7
Sheep, ...	8/0 19/0	13/0 15/0	15/0 17/6	17/6 £1
Pigs, clean, per lb. ...	2d. 4d.	3d. 3½d.	3d. 4d.	4d. 4½d.

Veterinary Report January and February, 1912.

BULAWAYO.

AFRICAN COAST FEVER.—Fresh Outbreaks.

Farm Inyorka.—An outbreak occurred on the 15th January amongst native cattle on the southern portion of the farm. On investigation it was found that some deaths had occurred the previous month.

The infected herds, comprising 171 head, were moved to a temperature camp on a clean portion of the farm, and three-day spraying, pending the erection of a tank, resorted to.

Three animals died and five were destroyed on showing a rise of temperature.

Farm Ntabanedede.—A native beast died on the 31st January. Coast Fever was suspected, and its existence was confirmed by the microscopic examination of gland and blood preparations. A tank had been erected on this farm, and three-day dipping was at once begun.

Farm Collaton.—The existence of Coast Fever on this farm was discovered on 17th February. Four deaths occurred. Dipping tanks are being erected on this and some of the adjoining farms, and the fencing of the farms Collaton and Irene is being completed.

EXISTING OUTBREAKS.

Induba Farm, Bembesi.—On January 2 and in February five animals died from Coast Fever, bringing the total mortality up to 22.

Three-day dipping has been carried out on this farm since the outbreak occurred in September last.

North Paddock, Mzingwani.—Four animals were destroyed, bringing the total mortality up to 30. The remainder of the herd, 43 head, will, unless otherwise disposed of, be removed to the Mzingwani Native Reserve as soon as the dipping tank is completed.

Spitzkop.—Total number of deaths to date, 2. Three-day dipping is carried out.

West Paddock, Mzingwani.—One animal destroyed.

Woollendale.—Two animals destroyed.

Bulawayo Commonage.—Notwithstanding the three-day dipping there has been a serious recrudescence of disease, 18 deaths occurring in January and 28 in February, bringing the total mortality from disease up to 107. Arrangements are being made for transferring some of the cattle to a clean portion of the Commonage.

MALLEIN TEST.

The following animals were tested on entry and found healthy:—

Horses	...	...	40
Mules	...	...	163
Donkeys	...	...	274

HORSESICKNESS INOCULATION.—58 mules inoculated. No deaths.

STOCK IMPORTED.—

Heifers	...	...	479
Bulls	...	...	18
Sheep and Goats	...	...	10,503

SALISBURY.

AFRICAN COAST FEVER.—No fresh outbreaks and no cases amongst the herds removed from the infected centres.

ANAPLASMOSIS (Gallsickness).—Eight deaths reported.

REDWATER.—Four cases occurred.

EPHEMERAL FEVER.—This disease appeared about the middle of February and affected large numbers of cattle in various parts of the district. Only a few deaths were reported.

MALLEIN TEST.—Three horses were tested on entry and found healthy.

MAZOE AND KIMBERLEY REEFS.

Ephemeral fever amongst cattle appeared in February.

MARANDELLAS.

ANAPLASMOSIS.—Eleven deaths occurred on the farms Newton and Devon, and one, an imported Hereford bull, on the Lendy Estate.

Ephemeral fever reported in February.

REDWATER.—One calf died at Marandellas Station.

HARTLEY.

Two head of cattle died from trypanosomiasis, and one from cyanide poisoning.

Ephemeral fever reported at Makwiro.

UMTALI.

AFRICAN COAST FEVER.—Existing outbreaks.

In January, a two months old calf in Messrs. Barry and English's herd died. Microscopic examination of smears

showed Kock's bodies. This is the second case in this herd. The first one, also a calf, died in January, 1911. During the interval the cattle have been kept under constant observation and have been regularly dipped.

WHITE SCOUR.—Was prevalent in one dairy herd.

IMPORTATIONS.—One horse, and 24 head of slaughter cattle from Macequece.

INYANGA, MAKONI AND MELSETTER.

AFRICAN COAST FEVER.—No fresh outbreaks, and no cases amongst the herds removed from infected veld.

GWELO.

Eleven mules were inoculated with horsesickness serum and virus with no fatalities.

ENKLEDOORN.

Ephemeral fever prevailed in the Charter section.

SELUKWE.

Three head of cattle died. Post mortem examination failed to show any symptoms of Coast Fever or other destructive disease.

VICTORIA.

Two deaths from gallsickness were reported. Several calves also died from common ailments.

An outbreak of rabies occurred in the township.

LOMAGUNDI, MACHEKE AND WANKIES.

Ephemeral fever reported in February.

Agricultural Reports

APRIL 1ST, 1912.

The unprecedented drought which has prevailed throughout the country has seriously retarded the crops, and it is obvious that many farmers will sustain considerable loss. The Salisbury district generally has not suffered so severely as some, but there will be a shortfall in the maize crop. However, owing to the partial character of the rains, quite a number of farmers will reap good harvests.

In the Mazoe district about half the usual maize crop is the most which can be expected, although at several farms, favoured with more than the average rainfall, fair crops are looked for. Beans and monkey nuts will be short, but tobacco, on the whole, has done fairly well.

The mealie crop in Lomagundi is better than in most other districts.

The present state of the crops in the Hartley district does not come up to the promise of four or six weeks ago. February commenced with fine rains, and things looked very hopeful for late planted mealies, sweet potatoes, beans and late grass, but these hopes were speedily dispelled, and the rest of the month passed with but little addition to the rainfall. March was also a very dry month, and the prospects of the maize crop are not bright. There are a few happy exceptions where farmers have had practically all the rain they wanted. The maize crop will probably be considerably under the average. It looks as though winter potato crops will have a bad time, unless rain comes soon. The hay crop,

though well up to the average, is an early one, and good prices will probably rule. The prospects of winter food for cattle do not look bright, and it behoves stock-owners to look well after this line.

The prospects of harvest in the Marandellas district are poor. Natives state that, unless rain falls soon, there will be no grain harvested in the Wedza reserve, except a little Munga. In the Shiota reserve the crops are a little better, but not up to the average.

The present state of the crops in the Umtali district is not good, and under the most favourable conditions between now and June not more than half the usual yield may be expected. Natives say they will be "hungry" before Christmas.

At Penhalonga a good maize crop is practically assured, and should be above the average. The yield of potatoes is ten tons per acre—twice as much as usually obtained.

Matabeleland has also suffered severely from the drought, and the prospects of a crop are by no means bright. Maize generally is very poor, but tobacco, although some growers will reap light crops, is very fair considering the dryness of the season. At Nyamandhlovu quite a good crop should be picked.

Reports from the Gwelo district are very much the same as those received from other places. The crops generally are poor, but the heavy lands are cropping well.

At Lalapanzi crops on the sand veld, particularly those under manure, are doing remarkably well. A considerable amount of wheat and oats has been planted in this district on moist vlei lands without irrigation. Potato crops appear somewhat disappointing.

Hay cutting is general throughout the country, and although the yield is lighter than in a normal season, the quality is considerably superior.

Native crops are poor everywhere.

Weather Bureau.

TEMPERATURES.

STATION.	JANUARY.		FEBRUARY.	
	Max.	Min.	Max.	Min.
MASHONALAND—				
Chicongas Location	81·2	65·8	88·1	63·5
Chishawasha	81·6	62·3	80·7	60·6
Hallingbury Farm (Hartley)	85·0	64·6	85·7	62·3
Mount Selinda (Melsetter)	77·1	62·3	79·6	61·3
Melsetter	76·2	—	76·0	—
Salisbury Agricultural Laboratory	79·3	60·9	79·2	59·7
„ Gaol	81·3	62·0	81·0	60·5
Sinoia	83·9	60·2	85·1	55·5
“ Summerfield ” (Umtali)	84·9	60·9	87·5	58·8
Victoria	81·4	63·4	83·4	62·3
York Farm (Inyanga)	74·4	56·9	77·4	53·8
MATABELELAND—				
Bulawayo Observatory	80·4	62·0	82·2	62·2
Empandeni	85·1	63·8	87·0	65·2
Gwelo Gaol	81·1	64·3	83·9	60·3
Plumtree	84·0	62·0	—	—
Rhodes Matopo Park	82·5	61·1	83·6	61·0
Tuli	93·5	67·2	94·4	70·2
Victoria Falls	85·5	68·1	80·6	65·4

RAINFALL.

STATION.	Jan.	Feb.
MASHONALAND—		
Ardgowan (Hartley)	7·79	5·25
Banket Junction	10·47	4·36
Charter (Meikle's Farm)	7·11	1·25
Charter Range	11·73	1·05
Chicongas Location	3·07	0·50
Chilimanzi	4·92	2·01
Chishawasha	10·71	4·61
Darwendale	6·39	4·18
Darwin	11·88	7·58
Driefontein (Umvuma)	9·61	1·33
“ Eagle's Nest ” (Makoni)	10·98	3·67
Eldorado Railway Station	7·37	4·51
Enkeldoorn	8·37	3·82
Gadzema (Giant Mine)	8·38	1·25
Gatooma	6·35	1·83

RAINFALL—continued.

STATION.	Jan.	Feb.
MASHONALAND—(Continued)		
Gatooma Railway Station	5'03	2'46
Goromonzi	8'59	9'96
"Grootfontein" (Umvuma)	8'43	1'65
Gutu	8'27	0'84
"Hallingbury" (Hartley)	5'92	1'39
Hartley Railway Station	6'28	3'14
Helvetia (Melsetter)	19'01	—
Inyanga (York Farm)	7'84	4'28
Inyanga (Police Camp)	9'95	3'49
Kanyamba	11'24	3'45
Lone Cow Estate (Lomagundi)	11'81	6'36
Lowdale	8'77	4'71
Macheke Railway Station	12'79	2'55
Makwiro	5'46	3'47
Marah Ranche	5'74	—
Marandellas { Railway Station	8'11	6'39
... .. { Land Settlement Farm	10'68	3'13
... .. { Good Hope	12'75	6'50
Marthdale (Victoria)	3'45	1'37
Mazoe	12'64	3'70
"Meadows" (Salisbury District)	13'24	5'06
Melsetter	8'19	2'25
Monte Cassino (Makoni District)	11'46	3'21
Morgenster	6'14	2'77
Mrewa	13'09	4'00
M'toko	7'26	—
Mount Selinda	13'03	2'84
Pamushama	8'01	1'48
Premier Estate	5'02	0'93
Police Station (Rusapi)	8'46	0'30
Rusapi Railway Station	8'61	0'70
Westridge (Salisbury District)	9'52	4'54
Salisbury { Gaol	10'38	4'62
... .. { Laboratory	10'39	4'38
... .. { Public Gardens	10'35	—
... .. { Railway Station	10'57	9'71
... .. { Stapleford	8'91	6'06
Shamva	9'84	6'38
Sinoia	8'16	6'20
Slenish (Mazoe District)	11'46	2'23
"Stoneygate" (Hartley District)	7'09	2'90
"Summerfield" (Umtali District)	10'28	4'66
Sunnyside (Mazoe)	11'77	2'66
Teign	12'39	2'90
"Tom's Hope" (N. Melsetter)	13'24	3'53
"Tweedjan" (Marandellas)	13'80	2'92
Umtali	5'31	1'40
Umtali Railway Station	5'71	1'80
Umtali (Mutambara Mission)	5'22	1'36
Umvuma Railway Station	8'83	2'34
"Utopia," Umtali District	6'07	1'45
"Vermont," Melsetter District	16'03	2'88
Victoria	6'56	1'34
Gokomere (Victoria District)	5'31	0'45

RAINFALL—*continued.*

STATION.				Jan.	Feb.
MATABELELAND—					
Balla Balla Railway Station	...	...	...	4'49	2'12
Battlefields Railway Station	...	...	...	—	2'52
Bembezi Railway Station	...	...	...	3'46	2'59
Bulawayo	...	...	{ Government House	—	—
			{ Observatory	3'96	3'36
			{ Raylton	4'26	3'56
Empandeni	...	...	...	1'47	1'76
Edwaleni	...	...	...	8'20	—
Essexvale	...	...	...	5'16	1'38
Fig Tree	...	...	...	3'65	1'45
Filabusi	...	...	...	3'02	0'84
Globe and Phoenix	...	...	...	12'06	2'36
Gwaai Railway Station	...	...	...	5'41	4'09
Gwanda Railway Station	...	...	...	4'18	1'55
Gwelo	...	...	{ Railway Station	5'39	1'12
			{ Lower	8'68	3'29
Heaney Railway Station	...	...	...	6'12	4'45
Imbeza Kraal	...	...	...	4'93	3'40
Insiza Railway Station	...	...	...	—	3'48
Inyati	...	...	...	9'61	1'29
Malindi	...	...	...	5'98	2'52
Mangwe Pass	...	...	...	2'37	1'11
Marula	...	...	...	3'02	2'02
Matopo Mission	...	...	...	6'46	1'82
Matopo Park	...	...	...	4'46	2'47
Maxim Hill	...	...	...	2'30	2'10
Mazunga	...	...	...	3'80	—
Melinakanda Junction	...	...	...	5'00	1'50
Mtshabzi Mission	...	...	...	2'82	—
Nyamandhlovu Railway Station	...	...	...	5'74	1'02
Plumtree	...	...	...	—	2'78
Que Que	...	...	...	14'77	3'25
Rhodesdale (Central Farm)	...	...	...	5'34	2'87
Rixon	...	...	...	3'45	2'03
Ringstead (Essexvale)	...	...	...	6'03	1'87
Selukwe Railway Station	...	...	...	8'77	1'49
"Shawlands" (Gwelo)	...	...	...	9'73	3'36
Solusi	...	...	...	5'06	1'85
Sebungwe	...	...	...	10'26	2'98
Syringa	...	...	...	2'06	2'98
Tegwani	...	...	...	4'66	2'10
Tuli	...	...	...	4'34	3'44
Tamba Farm (Belingwe)	...	...	...	3'10	2'65
Umgusa (Bubi)	...	...	...	2'79	—
Victoria Falls	...	...	{ Railway Station	7'10	5'20
			{ Police Camp	7'13	4'29
			{ Hospital...	4'82	1'89
Wankie	...	...	{ Railway Station	3'51	1'34
West Nicholson Railway Station	...	...	...	5'50	2'07

DATES OF MEETINGS OF FARMERS ASSOCIATIONS, Southern Rhodesia. (SUBJECT TO ALTERATION).

Name of Association.	Place of Meeting.	Secretary.	1912.										
			Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
*Central	Umvuma and Enkel- doorn	R. Aldons	27	25	29	27	31	28	26	30	28		
Chipinga	Chipinga	L. Dobell	25	11	11	25	13	10	31	12	10		
Enterprise	Artcurus	Jas. Watson	9	14	11	9	10	10	8	12	9		
Figtree Branch, R. L. & F. A.	Figtree Siding	A. Curtis	13	11	8	13	10	14	12	9	14		
Gatooma	Lower Melssetter	Lionel Gobell	4	11	8	4	10	7	3	9	7		
Gazaland	Hartley	H. F. Savory	6	11	8	6	10	7	5	9	7		
Headlands	Headlands	H. Barnes Pope	...	...	...	...	...	...	...	...	...
Insiza	Insiza Station and Peggy Store.	W. B. Harris	...	...	...	...	...	...	...	...	...
Kimberley Reefs	Kimberley Reefs	G. P. Watermeyer	14	12	9	14	11	8	13	10	8		
Lomagundi	Sinoia	P. W. Kidwell	...	...	...	...	...	...	...	...	...
Macheke	Macheke	G. F. Kidson	...	...	...	...	...	...	...	...	...
Makwiro	Makwiro	A. B. Fraser	20	18	15	20	17	21	19	16	21		
Makwiro and Norton	Xmas Pas Hotel	P. B. Snashall	6	4	1	6	3	2	7	4	2		
Manica	Marandellas & Settle- ment Farm.	C. M. Wright	6	4	1	6	3	17	5	2	7		
Marandellas	Marula Siding	MacW. Ingram	...	...	...	...	...	...	...	...	...
Marula	Salisbury	W. H. Williamson	6	4	1	6	3	7	5	2	7		
Mashonaland	Matopos Terminus Hotel.	W. E. Dowsett	...	...	...	...	...	...	...	...	...
Matopo Branch, R. L. & F. A.	Mamba Siding	M. W. Ingram	20	18	15	20	17	21	19	16	21		
Mamba Branch, R. L. & F. A.	Mazoe	V. W. Fynn	...	...	...	...	...	...	...	...	...
Mazoe	Various Farm Houses	N. N. Rutherford	...	...	...	...	...	...	...	...	...
Melssetter (North)	Gwelo	M. L. Price	13	11	8	13	10	14	12	9	14		
Midlands	Farm "Jerain"	A. Tulloch	4	2	6	4	1	5	3	7	5		
Northern Umali	Plumtree	Chas. Atkinson	12	10	14	12	9	11	11	13	13		
Pfumtse	Bulawayo	Harry Hopkins	26	31	28	26	30	27	25	29	27		
Rhod. Landowners & Farmers	Farm "Fairview"	S. Annandale	6	4	1	6	3	7	5	2	7		
Sonabula and Shangani Flats	T'Membarra Mission	N. N. Rutherford	...	...	...	...	...	...	...	...	...
Umvumvuma	Upper M'gezi	W. Kriener	17	15	19	17	21	18	16	20	18		
Upper N'gezi	Victoria	J. Rutherford	...	...	...	...	...	...	...	...	...
Victoria	Victoria	F. A. Readman	...	...	...	...	...	...	...	...	...
Victoria (Eastern)	Good Hope Farm	...	...	...	...	...	...	...	...	...	...

* Head Quarters at Umvuma. One Meeting in each quarter held at Enkeldoorn. † Meeting held at Settlement Farm.

Garden Calendar.

MAY AND JUNE.

By N. L. KAYE-EDDIE.

FLOWER GARDEN.

Most flowers which have bloomed during the summer months now gradually cease flowering and the beds will require well working up before winter flowering plants are put in. Carnations require attention and should be kept free of old blooms and the ground around the stems kept free and loose. If the ground has been well manured or mulched this will greatly assist in keeping in the moisture during the cold dry months which follow, and it must not be forgotten that constant stirring of the surface is also advantageous to this end.

Cuttings may be planted from most perennials and shrubs. Hard wood cuttings are best taken when it is seen that the sap is down, and should be kept warm and moist, care being taken in watering to give just sufficient moisture, as an excess tends to rot the cutting, especially if there is much organic matter in the soil used.

VEGETABLE GARDEN.

Potatoes which have matured during these months may generally remain in the soil and lifted as required.

Vegetables planted out for winter crops should be well and continuously cultivated, which will help to bring them along quicker with less watering. Late bearing tomatoes should be sheltered from the cold winds by a grass shield. Beans should be staked and tied.

Departmental Notices.

LECTURES FOR FARMERS.

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable, lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner but the suggestion of other themes is invited.

Agriculture.—Maize growing ; Maize selection and maintenance of the breeding plot ; Points of maize and maize judging, with demonstrations ; Utilisation of granite vlei soils ; Ground nut culture ; Rotation crops for home use and for sale ; Veld improvement by winter grasses ; Production of foodstuffs for the mines ; Ensilage ; Fungoid diseases of maize and wheat ; Wheat, oats, and lucerne under irrigation ; The prospects of cotton culture in Southern Rhodesia.

Veterinary Hygiene.—Detection and prevention of disease
The care of livestock.

Livestock.—Judging of cattle according to breeds, and for beef, milk, and draught ; feeding and kraaling of live stock ; hints on the principle of cattle breeding.

Chemistry.—The principles of soil fertility ; the principles of manuring ; the value of lime in agriculture ; chemistry of milk and its products (accompanied by demonstrations in milk testing).

Entomology.—Economic entomology on the farm ; the role of insects and their allies in the transmission of disease ; scale insects and fruit trees and methods for their control ; insect pests and maize ; enemies of the potato, insect and fungus ; the value and objects of plant import and nursery regulations.

Irrigation.—Methods of applying water to land for irrigation; the measurement of water in connection with irrigation; canal irrigation; storage reservoirs; hints on the selection of sites and on the design of earthen and other dams; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, soils, crops, processes and kindred matters, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without any indication of where they are from, or why they were sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding speci-

mens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particular regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

CO-OPERATIVE EXPERIMENTS.

DISTRIBUTION OF WINTER CEREALS.

The undermentioned winter cereal seeds will be available for distribution, free on rail Salisbury, under the usual terms of co-operative experiments, during the months of February to May, 1912.

Not more than four or five kinds can be issued to each applicant, and the weight of seed of each will be from 15 to 20lbs. The successful results which have been obtained with winter cereals when sown on naturally moist land without irrigation, justify the hope that any of those below mentioned are likely to prove satisfactory, and all are worth trial under such conditions, as also under irrigation where this is available.

Those marked with an asterisk have been found specially suited to non-irrigated land, and where birds are troublesome bearded wheats are preferable to beardless varieties. Quick maturing varieties are most suitable for land which dries out

early in the season, or for late planting. The most suitable amount of seed to sow per acre, has not yet been definitely determined but on most soils about 40—45lbs of wheat and rye and 60 to 70lbs of oats or barley usually appear satisfactory.

WHEAT.

*Early Gluyas,	beardless,	very early.
*Bobs,	„	mid. season.
*Golden Ball	„	„
*Zwart Baard	bearded	late
Medeah	„	„

OATS.

- *Sidonian, mid. season
- Texas
- Gray Side Oat
- *Algerian, requiring about seven months
- *New Zealand, late, a feed oat too coarse for forage

BARLEY.

- *Nepal barley wheat
- Chevalier malting barley

RYE.

- *Early Rye
- *Mammoth Late Rye—Slow maturing, under favourable conditions and if sown early can be fed off in mid. winter and allowed to run into ear in early spring.

Farmers receiving seeds under terms of co-operative experiments are reminded that they are under an obligation to report on the result of the experiments, as soon as the crop is reaped.

Applications should be addressed to the Agriculturist and Botanist, Department of Agriculture, Salisbury, and should be accompanied by full particulars as to the method of forwarding which is desired. In the case of consignments to be sent by Parcel Post or addressed to a siding, on which charges must be prepaid, the applicant should enclose cheque or post office order to defray expenses.

DESTRUCTION OF WILD CARNIVORA, ETC.

It is hereby notified for public information that rewards for the destruction of wild carnivora, etc., will be paid on the scale and conditions herein set forth.

2. Rewards will be paid as follows:—

For each lion	£5	0	0
For each leopard	1	0	0
For each cheetah	1	0	0
For each hyæna	0	10	0
For each wild dog	0	10	0
For each baboon	0	2	6
For each crocodile not less than 3 feet in length	0	10	0
For each crocodile over 1 and less than 3 feet in length ...	0	2	0
For each crocodile under 1 foot in length... ..	0	0	6
For each crocodile egg	0	0	6

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, of the district, within three months of the date upon which the animal is killed, on a solemn declaration on the prescribed form hereunto annexed.

4. In proof of destruction, applicants for rewards will be required to produce and surrender in the case of a leopard or cheetah the skin with the tail unsevered, and in the case of a hyæna, crocodile, wild dog or baboon the unskinned head. In the case of a lion to produce the skin and skull, the skull only to be surrendered.

5. The skins and heads surrendered for rewards shall become the property of the Government and shall be disposed of in such manner as may be decided on.

FORM OF DECLARATION.

I,.....do solemnly and sincerely declare that I did on the.....day of, and not before, shoot, trap, or poison (as the case may be)..... (describe the vermin for which the reward is claimed) in the district of.....within the boundaries of Southern Rhodesia, and that I am entitled to the reward offered by the Government.

And I make this solemn declaration conscientiously believing the same to be true.

.....
Signature.

Signed and declared at.....
this..... day of.....

Before me,

.....
Magistrate or Justice of the Peace.

CHEMICAL ANALYSIS OF AGRICULTURAL PRODUCTS.

Arrangements have been made for the chemical examination of soils, limestones; grain, and other produce; oil-seeds, cream, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

SERVICES OF AGRICULTURAL ENGINEER.

It is hereby notified for public information that the services of Mr. W. M. Watt, Agricultural Engineer, are available to the public for the following purposes. Assistance may be obtained by farmers:—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

DIPPING TANKS.—GRANTS IN AID.

The Government is prepared to assist farmers in the construction of private dipping tanks by a grant in aid on the £ for £ principle, but not to exceed, however, a total sum of £50.

This grant will only be paid to approved applicants, and after the tank has been inspected by an official appointed for this purpose and found suitable, and on production of receipted accounts in support of their claim.

Applications cannot be considered for grants in aid of tanks already constructed, and those wishing to avail themselves of this assistance should apply beforehand to the Director of Agriculture, from whom full particulars, together with plans and specifications, can be obtained.

SERVICES OF TOBACCO EXPERT.

Farmers wishing to avail themselves of the services of the above should apply to the Director of Agriculture, giving particulars of the nature of advice required, also the distance and direction of their farms from some well-known centre.

DEPARTMENTAL BULLETINS.

The following Bulletins, consisting of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia :—

AGRICULTURE.

- No. 2 The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., L.L.B.
- „ 35 The Conservation of Kraal Manure, by H. Godfrey Mundy, F.L.S.
- „ 81 Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S.
- „ 61 Requirements in sending Botanical Specimens to the Department for Identification.
- „ 56 The Use of Lime in Agriculture, by G. N. Blackshaw, B.Sc., F.C.S.
- „ 59 Plans and Specifications of Flue Curing Barns.
- „ 71 Report of Forestry in Southern Rhodesia, by J. Sims, F.H.A.S.
- „ 73 Hints on Irrigation—Small Gravitation Schemes—Pipes and Pipe Laying—by W. Martin Watt, Government Agricultural Engineer.
- „ 68 Fertility of Soils and Organic Matter, by G. N. Blackshaw, B.Sc., F.C.S., Government Agricultural Chemist.
- „ 64 Hints on Irrigation—Small Earthen Reservoir—by W. M. Watt.
- „ 79 Winter Cereals, by H. Godfrey Mundy, F.L.S.
- „ 99 Bean Crops, by H. Godfrey Mundy, F.L.S.

CROPS.

- No. 55 How Maize can be made more profitable, by H. Godfrey Mundy, F.L.S.
,, 112 Notes on Winter Cereals without Irrigation, by H. Godfrey Mundy, F.L.S., Government Agriculturist and Botanist.
,, 76 Suggestions for Cotton Growers, by R. H. B. Dickson.
,, 23 The Ground-nut or Pea-nut, by H. Godfrey Mundy, F.L.S.
,, 92 Manuring of Tobacco on Mr. L. Black's Farm, G. N. Blackshaw, B.Sc. F.C.S.
,, 57 Onion Growing, by H. Godfrey Mundy, F.L.S.
,, 67 Maize Breeding and Seed Selection, by H. G. Mundy, F.L.S., Government Agriculturist and Botanist.
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,, 93 Soy Beans, by R. H. B. Dickson.
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,, 75 Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by R. W. Jack, F.E.S.
,, 100 Tsetse—Preliminary Notes on the Habits of—by R. W. Jack, F.E.S.

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- No. 49 Notes on Bovine Plasmoses of Southern Rhodesia, with special reference to Mashonaland, by L. E. W. Bevan, M.R.C.V.S.
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Government Notices.

ANIMALS DISEASES AMENDING ORDINANCE, 1911.

Ordinance No. 2, 1911.]

[Promulgated 17th March, 1911.]

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. So much of the "Animals Diseases Consolidated Ordinance, 1904" (hereinafter referred to as the said Ordinance) and of any other law as may be repugnant to or inconsistent with the provisions of this Ordinance is hereby repealed.

2. The Administrator may, on the outbreak of a destructive disease, or when there is suspicion of the existence of such disease, declare an area around and including the place where such disease exists, or is supposed to exist, actively infected for the purpose of this Ordinance.

3. Whenever an area shall have been declared infected in terms of the last preceding section, the Administrator may, for the purpose of suppressing or controlling disease, cause such fences to be erected along the boundaries of or across any farms or land situated in such area as he may deem necessary.

4. (1) If the landowner shall not pay the cost of erecting any fence as aforesaid upon completion thereof, the cost shall be defrayed in the first instance out of moneys provided by the Legislative Council.

(2) When any fence erected as aforesaid runs along the boundary of a farm, the cost of the erection of such fence shall, if not sooner repaid, be repaid, together with interest at the rate of £5 per centum per annum, by equal yearly instalments commencing two years after the fencing is completed, such instalments being so calculated and fixed that the said cost and interest shall be wholly repaid within a period of fifteen years from the date when the first instalment became due.

(3) Such repayment shall be made by the adjoining landowners whose land has been divided by the fence. Each such landowner shall pay one-half the cost of the dividing fence and interest as aforesaid. When the adjoining land is a native reserve, or a portion of such reserve, the one-half of the cost shall be paid from funds in the local Treasury of the British South Africa Company.

(4) When any fence as aforesaid shall be erected within, and not on and along, the boundaries of any farm, the cost shall be paid from the funds of the local Treasury of the British South Africa Company, and the fence, when no longer necessary for the purpose for which it was erected, may be removed by the British South Africa Company; provided that the landowner shall have the right to purchase such internal fence at a price representing the total cost of such fence.

(5) The term "owner" shall mean (a) the person registered as such in the office of the Registrar of Deeds, (b) the British South Africa Company in respect of native reserves, and (c) the local authority in respect of municipalities.

5. Where the bed of a stream or river lies immediately between or constitutes the boundaries of land owned by private owners, the fence may be erected on one or other bank of the river or stream and across it, or partly on one bank, across it, and partly on the other bank, in such manner as may be agreed upon by the owners whose lands are separated by the said stream or rivers. The Administrator may call upon the said owners to agree to the position of the said fence on or before a date fixed by him, and, should they fail to do so, he may cause such fence to be erected without further reference to the said owners. For the purposes of repayment, such fence shall be considered as dividing the lands of adjoining owners, and half the cost shall be recoverable from each owner whose lands are separated by the said stream or river.

6. The Administrator may call upon any owner whose land has been fenced in terms of section 3 or 12 to provide sufficient security for the payment of any sums that may be due to the British South Africa Company in its local Treasury in respect of such fence. If the owner shall fail or refuse to provide such security, the Administrator may cause a notice in writing to be sent to the Registrar of Deeds of the amount due by such owner, and the Registrar shall make an entry thereof in respect of the land fenced. Such entry shall constitute an hypothecation of the land, ranking from the date on which the entry was made and for the amount therein stated; provided that the Registrar may pass transfer of land so hypothecated if the transferee agrees in writing that any sums due and unpaid shall remain and be registered as a charge against the said land.

7. When any land held under lease or permit of occupation has been fenced in terms of this Ordinance, during the term of such lease or permit the lessee or permit holder shall pay to the proprietor of such land yearly, during the continuance of the lease or permit of occupation, interest at the rate of £5 per centum upon so much of the cost of the fence as the proprietor is liable for, and such payment shall be made with the rent of the land, and shall be deemed in law to be part of such rent.

8. Any tenant or holder of land under a permit of occupation having a right to purchase such land at a fixed price shall, on completion of the purchase, pay to the proprietor, in augmentation and as part of the purchase money, any sum paid by such proprietor for the fencing of such land, and shall become and be liable to repay to the British South Africa Company in its local Treasury such sums as remain unpaid, as the same become due and payable in terms of this Ordinance.

9. Where in the case of any local authority the title to land provides that upon the sale thereof the British South Africa Company shall be entitled to receive a proportion of the purchase price, the local authority shall be entitled to deduct from the purchase price of land sold any debt due or amount paid by it in respect of fences on the land so sold erected under this Ordinance.

10. The provisions of sections 14 and 15 of the "Fencing Ordinance, 1904," in regard to repairs shall, *mutatis mutandis*, apply to fences erected in terms of this Ordinance.

11. Where a fence crosses any road used as of right by the public or by any neighbouring landowner, a properly constructed swing gate shall be placed at the point of crossing.

12. Any person opening such gate, except for the purpose of passing through, or omitting to close such gate after having passed through, and any person damaging such gate and omitting to immediately repair such damage, shall be liable to a fine not exceeding £10, or in default of payment to imprisonment with or without hard labour for a period not exceeding one month.

13. The Administrator may, for the purpose of the more effective prevention or control of disease, apply the provisions of this Ordinance in respect of fencing to municipalities and townships and such land adjoining as may be deemed expedient, and to places within a radius of ten miles of an area declared actively infected in terms of section 2 hereof, if, owing to the number of cattle in such places, or other causes, it appears expedient.

14. (1) The owner or proprietor of the land along the boundaries of which fences have already been erected by the British South Africa Company for the purpose of preventing the spread of African Coast Fever in cattle shall be and is liable to repay to the British South Africa Company in its local Treasury one-half of the cost of so much of the fence as may be along the boundary of such land. The provisions of sections 7 and 8 of this Ordinance shall apply in the case of land held under lease or permit of occupation along the boundaries of which fences have already been erected. The British South Africa Company may remove any such fence already erected which is within and not on or along the boundaries of any land when no longer necessary for the purposes for which it was erected.
- (2) Any payment due in respect of any such fence may be made as provided by section 4 of this Ordinance, and under the like conditions as to security for such payment as are prescribed under section 6.

15. Within any area declared by the Administrator to be actively infected under the provisions of section 2, or to which the provisions of this Ordinance shall have been applied in terms of section 12, the Administrator may, for the purpose of more effectively preventing the spread of disease cause to be constructed on any land a dipping tank and any structures incidental thereto or other appliances for the dipping of stock, and may recover the expenditure incurred from the owner of the land on which such tank, structures or appliances have been constructed. The cost of such tank, structures or appliances shall be paid on the same terms and under the same conditions as are applicable to boundary fences under sections 4, 6, 7 and 8 of this Ordinance.

16. In addition to any penalties that may be imposed under the said Ordinance or any amendment thereof, or under any regulations framed thereunder for the unlawful movement of cattle, the Court of the Magistrate before which the case is tried or the High Court in the like instance may direct the confiscation of any cattle unlawfully removed, and such cattle, if infected with disease or likely to convey infection, shall be destroyed without compensation. Should there be no danger of infection the Administrator may order such cattle to be temporarily kept at any spot denoted by him and then sold. The proceeds of any such sale shall be paid to the British South Africa Company in its local Treasury.

17. Section II, sub-section (1) of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Should any Inspector, Sub-Inspector or any person specially authorised by the Administrator to carry out the provisions of this Ordinance know or suspect that any animal is infected with any destructive disease such Inspector, Sub-Inspector or other authorised person may forthwith place such animal in quarantine, together with such land as is necessary, for its isolation, and such animals as have been or are suspected of having been in contact with such animal or with infection. Notice of such quarantine shall be given in writing to the owner or custodian of such animal and to the Magistrate of the district, and shall remain in force for such time as the Chief Inspector or Controller of Stock may direct, unless the Administrator shall sooner, if he thinks fit, issue the notice referred to in sub-section (2) of section 5. A copy of the notice of any such quarantine shall be posted at the office of the Magistrate, and shall be inserted by the Magistrate in some newspaper, if any, circulating in the district.”

18. Section 16 of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Any Government Veterinary Surgeon or any person thereto authorised by the Controller of Stock, Chief Inspector or by a Magistrate may enter any land, building, kraal or enclosure for the purpose of inspecting animals. Should any animal be found to be infected with any destructive disease, or should such infection be reasonably suspected, he may quarantine such animals as in this Ordinance provided, and may order the proper disinfection of any building, kraal or enclosure in which such animal is or may recently have been, and the furniture and fittings thereof. Should it be impossible to properly disinfect such stable, kraal or enclosure, furniture or fittings in any of them, he may order the destruction thereof; provided that no building, kraal or enclosure shall be destroyed unless the owner consents thereto in writing, or failing such consent, the Administrator orders that such destruction be carried out.”

19. Section 22, sub-section (1) of the said Ordinance is hereby amended by the addition of the following words after the word “obtained” in the twelfth line of the said sub-section, “and any person receiving or taking delivery of any animals without having ascertained that such permit has been obtained.”

20. This Ordinance may be cited as the “Animal Diseases Amending Ordinance, 1911,” and shall be read as one with the “Animals Diseases Consolidation Ordinance, 1904,” and the “Animals Diseases Amendment Ordinance, 1910.”

No. 100 of 1912.

[21st March, 1912.]

FENCING ORDINANCE, 1904.

UNDER and by virtue of the powers conferred on me by the "Fencing Ordinance, 1904," I do hereby define the area as described hereunder to be a district for the purposes of the said Ordinance, and, in terms of sections 3 and 4, Part I thereof, bring the provisions of the said Ordinance into operation in the aforesaid district, as from the date hereof.

DESCRIPTION OF THE AREA.

That portion of the Hartley district comprising the following farms and reserves: Lion Hill, Hiltonia, Fenhurst, B.S.A. Company's Reserve, Acton, Benga, Itafa, Combe, Halfway, Clonmorran, sub-divisions of Railway Farm No. 10, Nos. 1, 2 and 3, Sabonabon, Lanteglos, Lanteglos East, Hope Farm, Blue Ranges, Hillside, Umsweswe and the B.S.A. Company's Reserve north of Railway Farm No. 9.

No. 216 of 1911.]

[15th June, 1911.]

DESTRUCTION OF WILD CARNIVORA, ETC.

IT is hereby notified for public information that His Honour the Acting Administrator has been pleased to approve payment of rewards for the destruction of wild carnivora, etc., on the scale and conditions herein set forth.

2. Rewards will be paid as follows:—

For each lion	...	...	£5	0	0
For each leopard	...	...	1	0	0
For each cheetah	...	...	1	0	0
For each hyæna	...	...	0	10	0
For each wild dog	...	...	0	10	0
For each crocodile not less than 3 feet in length	...	...	0	10	0
For each baboon	...	...	0	2	6

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner and to natives by the Native Commissioner of the district, within three months of the date upon which the animal is killed, on a solemn declaration on the prescribed form hereunto annexed.

4. In proof of destruction, applicants for rewards will be required to produce and surrender in the case of a leopard or cheetah the skin with the tail unsevered, and in the case of a hyæna, crocodile, wild dog or baboon the unskinned head. In the case of a lion to produce the skin and skull, the skull only to be surrendered.

5. The skins and heads surrendered for rewards shall become the property of the Government and shall be disposed of in such manner as may be decided on.

FORM OF DECLARATION.

I,, do solemnly and sincerely declare that I did on the..... day of and not before, shoot trap, or poison (as the case may be) (describe the vermin for which the reward is claimed) in the district of within the boundaries of Southern Rhodesia, and that I am entitled to the reward offered by the Government.

And I make this solemn declaration conscientiously believing the same to be true.

Signature.

Signed and declared at..... this..... day of.....

Before me,

Magistrate or Justice of the Peace.

No. 104 of 1912.]

[28th March, 1912.

UNDER and by virtue of the powers vested in me by sub-section (7), section 4, of the "Game Law Consolidation Ordinance, 1906," I do hereby authorise the destruction of hippopotami, in or near the Zambesi River within ten miles of and above the Victoria Falls, by members of the British South Africa Police or by other persons acting with the written permission of and under the direct control of the Police.

No. 387 of 1911.]

[21st December, 1911.

DESTRUCTION OF WILD CARNIVORA,

IT is hereby notified for public information that His Honour the Administrator has been pleased to approve payment of rewards for crocodile eggs and crocodiles under three feet in length, in addition to the rewards mentioned in Government Notice No. 216 of 1911, on the scale and conditions herein set forth.

Rewards will be paid as follows:—

For each crocodile egg	6d.
For each crocodile under one foot in length	6d
For each crocodile one foot and under three feet in length, 2s.	

Applicants for rewards must produce and surrender the eggs, and in the case of crocodiles under three feet in length, the body with the head and tail not severed.

No. 86 of 1912.]

[7th March, 1912.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 101 of 1909, and declare the disease amongst live stock known as *Trypanosomiasis* to be a destructive disease within the meaning of the said Ordinance.

No. 308 of 1911]

[5th October, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby:

1. Cancel and withdraw section 19 of Government Notice No. 329 of 1910, and in lieu thereof substitute the following:—

"All Cattle within the limits of the various commonages, townships and actively infected areas, or on common grazing ground, shall be dipped or sprayed at least once every three days, unless the Chief Inspector of Stock shall, for sufficient reason, authorise the extension of the time between such dipping or spraying, or the entire suspension of the same.

2. Further amend section 16 of the aforesaid Government Notice by the addition of the following clause to the proviso published under Government Notice No. 200 of 1911:—

"(c) Cattle for *bona fide* farming and dairy purposes may be moved into and within such declared areas, under the conditions of sections 5 and 6 of the above-mentioned Government Notice, and under such other conditions as may be imposed by the Chief Inspector of Stock."

No. 382 of 1911]

[21st December, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," and the "Animals Diseases Amending Ordinance, 1911," I do hereby declare the following area to be actively infected with the disease known as African Coast Fever, for the purpose of the said Ordinances:—

"That part of the native district of Umtali lying south of a line drawn from the eastern beacon of the farm Mabonda; thence along the

north-eastern and northern boundaries of same to the northern boundary of Coldstream and the northern boundary of Savillen to the Odzani river; thence down this river to its junction with the Odzi river."

Ordinance No. 18, 1911.]

[Promulgated, 26th January, 1912.

AN ORDINANCE TO AMEND THE "CO-OPERATIVE
AGRICULTURAL SOCIETIES ORDINANCE, 1909."

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof as follows:—

1. So much of the "Co-operative Agricultural Societies Ordinance, 1909" (hereinafter called the said Ordinance), and of any other law as may be repugnant to or inconsistent with the provisions of this Ordinance, is hereby repealed.

2. Notwithstanding anything to the contrary contained in section 19 of the said Ordinance, the Administrator may, on sufficient cause being shewn, authorise any Society formed thereunder, from time to time to raise a loan involving a liability exceeding £100, or to alter the rules of the Society at a special meeting convened in terms of the said section; provided two-thirds of the members of the Society record their approval thereof by votes in person at such meeting, or in writing in the manner prescribed in the next succeeding section.

3. The person entrusted with the sending of notices calling a meeting for any of the purposes set out in the last preceding section shall send to each member of the Society, together with such notices, a statement setting out concisely the matter to be submitted for the approval of the meeting and a form on which the member to whom it is addressed may record his approval or disapproval by writing the words "yes" or "no" as the case may be. Such form shall be signed by the member using the same and delivered to the person appointed to receive it not later than twenty-four hours before the date of the meeting at which it is to be used.

4. This Ordinance may be cited for all purposes as the "Co-operative Agricultural Societies Amendment Ordinance, 1911."

No. 11 of 1912.]

[11th January, 1912.

AFRICAN COAST FEVER.

TRANSPORT CATTLE.

UNDER and by virtue of the powers vested in me I do hereby cancel and withdraw Government Notice No. 184 of 1911, and do hereby declare the areas described in the subjoined Schedule A as areas within which the use of cattle for draught purposes may be permitted under the conditions of the regulations governing the movement of cattle.

SCHEDULE A.

1. PLUMTREE.

An area lying west of the Nata and Tjankwa Rivers, from where the latter crosses the farm Tjankwa; thence along the northern boundary of this farm to Burntside; thence bounded by and including the following farms: Burntside, Orange Grove, Glencoe, Stylfontein, Sterkfontein, Ramaquabana Reserve Extension, Empandeni, Home farm, Sleepy Hollow, Castleblock, Ingwesi, Pieter's farm, Lewis's farm, and Mphoeng's Extension.

2. MARULA SIDING.

An area bounded by the eastern boundary of the Plumtree area from the junction of the Manzamnyama and Tjankwa Rivers to Lewis's farm; thence in a south-easterly and easterly direction along the boundary of the area proclaimed under Government Notice No. 254 of 1910, to the Shashani River; thence up that river to the south-eastern beacon of Beaconsfield; thence by and including the following farms: Warnaford, Shashani, Edenvale, Marshlands, Wilfred's Hope, Mananda, Manda, Sherwood and Pandis; thence down the Natane River to its junction with the Manzamnyama River; thence down attar to the point first named.

3. FIGTREE.

An area bounded by a line drawn from the junction of the Natane and Manzamnyama Rivers to the south beacon of the farm Mananza; thence by and including the following farms: Riverbank, Vunda, Bickley, Beckengham, Penge, Norwood, Ascot Estate West, Welcome, Pendennis, Honeybird-kop, Vreigevicht, La Concorde, De Hoop, Forwards; thence to a point where the Ove River crosses the southern boundary of Forwards; thence down the Ove River to where it intersects the northern boundary of the farm Ove; thence westerly along the north-west boundary of the farm Ove; thence by and including the farms Undza, Lushongwe, Malala, Kezi and Junction; thence along the southern boundary of Mount Edgecombe to its south-western beacon; thence in a northerly direction along the eastern boundary of the Marula area to the point first named.

4. WESTACRE JUNCTION.

An area embracing the following farms: Joe's Luck, Klipspring, Irene and Collaton.

5. BULAWAYO AREA.

An area bounded by and including the following farms: Alnwick, Dewsbury, Millievale, Ireland, Bleu Bonny, Craiglea, Stoney Croft, Bilars, Slights, Helenvale, Redbank A, Devonby, Seaborough, Umkien, Fundisi, Imbeza Kraal, Lower Nondweni, Mani, Willsgrrove, 100 acre lots, Claremont, Outspan No. 1 Tuli Road, Emangeni, Inyorka and Sauerdale.

6. HEANEY JUNCTION.

An area including the following farms: Maxim Hill, Three Fountains, Driehoek, Maldon, Imbeza Block, Springs, Hope Valley, Duncal, Kirton and Wilsendale.

7. BEMBESI STATION.

An area bounded by the Heaney Junction and Bulawayo areas as far as the farm Kennebec, thence along the western boundaries of Kennebec, and by and including the farms Kennebec, Galeta's Kraal and Umgusa Block; thence along the north-eastern boundaries of Winter, Spring and Eland to the south-western beacon of Westland Row; thence along the western boundaries of Westland Row, Bembezaan Westgate; thence by and including Goodwood Block, Gourlay's Block, Crescen's Syndicate Block, Lavender Grange, Dromoland, Oscardale, Half Ration Ranche, Wessels, Greenlands, Lochard Block, Rouseville, Inyozan, Fochabers subdivision A, Kodhwayo, Zimbili and Victory.

8. INSIZA NORTH.

An area, with access to Insiza Station, comprising the following farms: Alendale, Ensangu Block, Insangu Reserve, Murray's farm, Frei's farm, and that part of Bulawayo Syndicate Block, Mbatl Tiabetsi Block, lying west of the road from Frei's farm to Insiza Station.

Note.—Access is granted for ox transport from the above-described area to Insiza Station subject to the condition that oxen will not be allowed to cross the railway line.

9. INSIZA SOUTH.

An area bounded by and including the following farms: Blackwaters, Carlssen's Glenorchi, Glenavon, N'dumadombi, Perly Cross, Pioneer farm, Altire, Three Fingers Outspan, Foxdale, Heathfield, Woodstock, Idutwa, Kildare, Lancaster, York, Indina, Wessel's Block, Nauhoho Block, Field farm, Ungungusse, Tekwe Outspan and Magoholo.

10. SHANGANI NORTH.

An area bounded by and including Ruby Block, Blinklip, Zenda, Gillman, Barehill, Ceylon, Clare, Hampton, Torva Block, from the northern beacon of Torva Block along the boundary of Thompson's farm to the Vungu River; thence down the Vungu and Shangani Rivers to the Shangani Reserve; thence along the eastern boundary of the said reserve to the northern beacon of Gourlay's Block; thence along the north-eastern boundaries of Gourlay's and Crescen's Syndicate Blocks to the farm Sunny Ranche, thence by and including the farms Sunny Ranche, Auckland, Manbo, Umsungwa Ranche, and that portion of the Bulawayo Syndicate Block, Mbatl Tiabetsi Block not included in the Insiza North area, Esmyangeni Block, Pongo Outspan; thence along the railway line to the eastern boundary of the East Shangani Block, and thence to the south-eastern boundary of the Ruby Block.

II. SHANGANI SOUTH.

An area bounded by the railway line from the western boundary of the farm Oaklands to the eastern boundary of the East Shangani Block; thence by and including East Shangani Block, Teakwood, Arupanga, De Beer's Block, Virginia, Umchingwe, Umchingwe Block, Greystone Block, Obocoosco, Wolfscrag, Ruins, Albany, Tsinda, Parkyn's farm, and the south-western boundary of Oaklands to the railway.

12. SOMABULA SIDING.

An area bounded by and including the following farms: Dawson's farm, Four Chums, Lewis's farm, West Gwelo Block, Ghoko Block, Brown's farm, Byrne's farm, St. Patrick, Dewhurst, Fairfield, Forfar, Scrub, Woodland and Kenilworth.

13. GWELO STATION.

An area bounded by a line drawn from a point on the Shangani River where it enters the Shangani Reserve; thence northwards along the boundary of that reserve to the Gwelo River and up that stream to the north-western corner of the Main Belt Block and along the northern boundary of that property to the Que Que River; thence up the Que Que River and the Long Valley Spruit to the northern boundary of the farm Long Valley; thence to the north-western beacon of that farm and along its western boundary; thence along the northern and eastern boundaries of Strathfillan, the southern boundaries of Adair and Wodchouse, the western and southern boundaries of Que Que Reserve; thence along the eastern boundaries of Lochiel, Netherby, Stonefield, Kanuck, Ranjah's Ranche, Dopton, Wildebeeste Block and Safago; thence along the southern boundary of Safago and Divide, Kanuck, and the south-eastern boundary of Watershed Block, and from the most southerly beacon of Watershed Block in a direct line along the eastern and north-western boundaries of the West Gwelo Block to the south-eastern beacon of Somabula; thence along the southern boundary of that farm, Somabula, Meadows, Good Hope, Johnston, and along the western boundaries of Johnston, Vungwana South, Vungwana North, and the south-western boundaries of Walton, Henley, Ensors, Desvages, the Vungu Block, and Thompson's farm to the Vungu River; thence down that river to its junction with the Shangani River, and down that river to the starting point.

14. REDBANK.

An area bounded by and including the following farms: Thornvalley Block, Harris, Stevens, Tableland, Seale, Condene, Redbank B, Richardson's, Bell's, Badminton Block, M'nondu, Ascot Estate, Naseby North and South, Stanhope South, M'kuse, Chesa, Luvo and Samunya.

15. NYAMANDHLOVU STATION.

An area bounded by and including the following farms: Moana, Wainoni, Loskey, Cawston Block, Umuzaan Block, Hilda's Kraal, Spring Grange, Rochester, Acutt's and Crewe's Block, Vincents, Alicedale, Imvani, Springs, North Stanhope, Bromley, Eden, Catford, Impanya, Mananza, and from the south beacon of the latter in a direct line to the junction of the Tjankwa and Natane Rivers; thence down the latter to the boundary of the Gwaai Reserve; thence along this boundary in an easterly direction to the south-western boundary of the Seafeld Estate; thence by and including Seafeld, Norfolk, Buchanan, Langvlaagte and Matabeleland Concession.

16. MALINDI STATION.

That portion of Matabeleland within the following boundaries: From a point on the Zambesi road 20 miles south of the Wankies-Deka road along the southern boundary of the Wankies coal area to where it is crossed by the Inyantue River; thence down this river to its junction with the Gwaai River; thence up the latter to the south-east beacon of farm No. 97; thence along the southern boundary of this farm in a straight line to Intundhla Siding; thence in a straight line to where the Manzamuyama River crosses the western boundary of this territory; thence up this boundary to the point started from.

17. WANKIES AREA.

An area including the Wankies coal area and that portion of Matabeleland west of the railway between the southern boundary of the Matetsi area and a line drawn 20 miles south of the Wankies-Deka road.

18. MATETSI SIDING.

An area bounded by a line drawn from the junction of the Kafuli and Matetsi Rivers to Kesi; thence to Missis Pan on the Bechuanaland border; thence along the border in a south-easterly direction to the farm Pandamatenka; thence from the south-western Leacon of that farm to the south-western beacon of Guyo along the southern boundary of the latter to the Tshowe road; thence along the latter to the farm Tshowe; thence along the western, southern and eastern boundaries of the latter and in a direct line to the south-western beacon of Railway farm No. 22; thence in a direct line to the first-named point.

19. MATOPO TERMINUS.

An area bounded on the west and north by the Marula, Figtree, Westacre Junction and Bulawayo areas, and from the farm Adams by and including Adams, Florencedale and Absent; thence from the south-eastern beacon of the latter in a direct line to the eastern beacon of Kozi; thence along the northern boundaries of Leilavale and Wenlock Block, and along the western boundary of the latter to its southern beacon; thence along the southern boundary of the Tuli River farm, the north-western boundaries of Goto and Hwatalala, to where the latter is intersected by the Mwewe River; thence by a line due west to the Shashani River.

20. SABIWA SIDING.

An area comprising the following farms: Blanket, Vubachikwe, Hotel, Hampden Place, Insindi Block, Judd's, Wenlock Block, and Sheet.

21. GWANDA STATION.

An area bounded on the north by the Matopo and Sabiwa areas, to the south-eastern boundary of the latter; thence by and including the farms Exchange, Doelfontein, Deney's, Nelson's, Makunkubi, from the southern beacon of the latter along the southern boundary of Jahoonda, the western and southern boundaries of Railway Block No. 2 to the Umzingwani River; thence down the latter to the boundary of the area proclaimed under Government Notice No. 254 of 1910; thence along the latter to the Shashani River; thence up this river to the southern boundary of the Matopo Terminus area.

22. WEST NICHOLSON.

An area bounded by and including Copthall Block No. 2, Rathgar, Forest Hill, Thornwood Block, Macauly's Jahoonda, Railway Block No. 2; thence from the point where the Umzingwani River crosses the southern boundary of this block, down this river to the boundary of the area proclaimed by Government Notice No. 254 of 1910, along this boundary to the Buby River, down this river to the southern boundary of this territory; thence in an easterly and north-easterly direction along this boundary to the Lundi River; thence up this river to where the Tuli-Victoria Column road crosses it; thence down this road to Pilgrim's Rest farm; thence bounded by and including Pilgrim's Rest, Ingwe, Katanga, Sibula, Groot Vlei, Pela, Pirie, Onderbrook, Mubulu, Tubisi, Inanda, Hluku, Vukwe, Bangwe, Inyosi, Olympus Block and River Block.

23. BELINGWE.

An area bounded on the south and east by the West Nicholson area and on the east and north by the Selukwe and Shangani South areas; thence by and including the following farms: The Springs, Bannockburn, Sandeman's farm, Mimosa, Bungwe, Springvale, The Doro, Summer, Mooifontein and Anglo-French Syndicate Block; thence from the southern beacon of the latter down the boundary of Belingwe Reserve No. 2 to the point where the Buby River crosses into the farm Grasspan; thence down this river to the boundary of the West Nicholson area.

24. SELUKWE AREA.

An area bounded by a line drawn from the south-western beacon of the farm Lubongo to the Lundi River; thence down the latter to its junction with the Tokwe River; thence up that river to the north-eastern beacon of Idada farm No. 1; thence along the northern boundary of that farm, Selukwe Reserve, Idhwala farm No. 1 and Muirhead; thence along the western boundary of Muirhead and the northern boundaries of Depoto and Tibilikwe; thence along the western boundary of Tibilikwe to the north-eastern beacon of Home; thence along the eastern boundary of Home, Slade's and Lancastershire Estate to the south-eastern beacon of the latter; thence along the southern and western boundaries of Lancastershire Estate, the southern boundary of Wallclose, western boundaries of Hyrcania, Fairview, Figtree, Boulder Beacon, Ghoko Plains, Adamantia and Dorset, and from the south-western beacon of Dorset, along the southern boundaries of Dorset, Clifton, Mkatsi, along the southern boundary of Welsh farm block to the first-named point.

25. SURPRISE SIDING.

An area including the following farms: Wallclose, Beacon Kop, Home, Slade's, Lancastershire Estate and Engesa source.

26. INDIVA SIDING.

An area including the farms Linsdale, Gando, Whawha Outspan, Indiva Albany, Hashu, Highlands, Umtebekwe, Hainault, Gubire and Elliott.

27. LALAPANZI.

An area bounded by a line drawn from the north-eastern beacon of Linsdale, along the northern boundaries of the farms Linsdale, Gando, Whawha Outspan, the western boundaries of Ingeni, Boulder, Umhlali; thence along the south-eastern boundary of the Que Que Reserve to its north-eastern beacon; thence along the southern and eastern boundaries of Ashdale, the eastern boundaries of Bunsu, Shava, and Oryx to the Sebakwe River; thence up the Sebakwe River to the north-western boundary of the Central Estates; thence following the boundary of that estate to the north-eastern beacon of Kleinfontein and along the northern and western boundaries of that farm, and along the eastern boundaries of Mansfield and Finland to the Tokwe River, down that river to a point due east of the Senangwe Hill; thence to the north-eastern beacon of the Selukwe Reserve and along the northern boundary of that reserve to the south-eastern beacon of Elliott; thence along the eastern boundaries of Elliot, Hainault and Guburie, and the southern boundaries of Partridge and Wojele, and the western boundary of the latter farm to the point first-named.

28. IRON MINE HILL SIDING.

An area included within the following boundaries: From a point where the Iron Mine Hill-Victoria Road crosses the Ngesi River; thence down this river to its junction with the Tokwe River; thence down this river to its junction with the Lundi River; thence down this river to its junction with the Sabi River; thence up the latter to the Umvuma Siding area; thence along the southern boundary of this area to the point started from; thence bounded by and including the Iron Mine Hill-Victoria road from the Ngesi River to Iron Mine Hill Siding, Iron Mine Hill farm, Upland and Kleinfontein farms.

Note.—Pending construction of a railway towards Victoria, transport cattle from this area will be permitted to Umvuma Siding on condition that such cattle return immediately to their own area.

29. UMVUMA SIDING.

An area enclosed by a line from the confluence of the Sabi and Divuli Rivers, up the former to the south-east beacon of Sabi-Oog; thence northwards along the eastern boundaries of Sabi Oog, Sunnyside and Penhoe, and the northern boundaries of Penhoe, Bucknall, Glynn, and Erdington Estate; thence along the western boundaries of Erdington Estate and Morrell to the south-eastern beacon of Mexico; thence along the southern boundary of

Mexico, the eastern boundaries of Adelina and Glengarry, and southern boundaries of Glengarry, Phillipsdale and Christiana to the Ngesi River, and down that river to the Mashaba Hills; thence southwards to the Umniati beacon on the Umniati River; thence direct to the north-western beacon of Welgevonden, and along the western boundaries of that farm, Vrede, Bergeplaats and Bergendale to the Sebakwe River; thence up that river to where the boundary of the Central Estates crosses it; thence along the north-western and south-western boundaries of that estate to a point where it is crossed by the Iron Mine Hill-Victoria road; thence along the north side of that road to the Shashi River; thence down that river to the south-western beacon of Gurajena Reserve; thence following the eastern boundary of the Chilimanzi district to the south-western beacon of Merlin; thence along the southern boundaries of Merlin and Gowrie to the Umtilikwe River; thence direct to Gongwe Hill and along the northern boundary of the Gutu Reserve to the Divuli River, and down that river to the first-named point.

30. HUNTERS ROAD SIDING.

An area bounded by a line drawn from the south-western beacon of Adair, along the western boundaries of that farm and Barkly and the southern boundary of Boschklouf, and along the western and northern boundaries of Long Valley to the Long Valley Spruit and down that stream to its confluence with the Que Que River; thence up that river to the north-western corner of Watermael, along the northern and eastern boundaries of that farm and the eastern boundaries of Shawlands, Loads, Sunbury, Dwaalvlaakte and Wodehouse; thence along the southern boundaries of Wodehouse and Adair to the first-named point.

31. QUE QUE STATION.

An area bounded by a line drawn from the north-east corner of Oryx down to the Sebakwe, Umniati and Sinyati Rivers to the junction with the Zambesi, up that river to its junction with the Sengwe, and up that river to its junction with the Lutopi River; thence in a straight line to the junction of the Shangani and Gwelo Rivers, and up the latter to the north-west corner of the Main Belt Block; thence along the northern boundary of that block to the Que Que River, up that river to the most westerly corner of Watermael, along the northern and eastern boundaries of that farm, Shawlands, Loads, Sunbury, Dwaalvlaakte, Wodehouse, Ermelo, Umsungwe Block, to the most southern beacon of the Que Que Reserve; thence along the south-eastern boundary of Que Que Reserve to its north-eastern beacon; thence along the southern boundary of Ashdale; thence along the eastern boundaries of Ashdale, Bunsu, Shava, Oryx, to the starting point.

32. BATTLEFIELDS.

An area within the following boundaries: From the junction of the Umsweswe and Umniati Rivers, up the latter to the Mashaba Hills; thence along these hills in a northerly direction via the Bumbi beacon to the Umsweswe River; thence down this river to the point started from.

33. HARTLEY AND GATOOMA.

An area bounded by a line drawn from the confluence of the Umfuli and Umniati Rivers; up the latter to its junction with the Umsweswe; thence up the latter to the Mashaba Hills; thence southwards along that range to the Bumbi beacon; thence in a straight line southwards to the Ngesi River; thence up that river to the eastern boundary of the Mondoro Reserve; thence in a north-easterly direction along the eastern boundary of the same to the Dorango River; thence down this river to the Umfuli, thence down the Umfuli to the point first named.

34. GADZEMA STATION.

An area bounded by a line drawn from the confluence of the Umsengaisi and Umfuli Rivers, up the latter to the drift on the old Hartley-Salisbury road; thence northwards to the south-western beacon of Railway Farm No. 22, along the western boundary of that farm and the eastern boundary of Railway Farm No. 21 to its north-eastern beacon; thence in a northerly

direction to Hunyani Poort; thence westwards in a straight line to the Umsengaisi River, and along that river to the point first named, including Reynardia.

35. MAKWIRO STATION.

An area bounded by a line drawn from a point on the Umfuli River at the drift on the old Hartley-Salisbury road; thence northwards to the south-western beacon of Railway Farm No. 22; along the western boundary of that farm and the eastern boundary of Railway Farm No. 21 to its north-eastern beacon; thence in a northerly direction to Hunyani Poort; thence up the Hunyani River to the western boundary of the Hunyani Estate; thence along the western and southern boundaries of that estate to the north-western beacon of Railway Farm No. 29; thence along the western boundary of that farm and the eastern boundary of Railway Farm No. 28, Makwiro Source and Ardmore; thence in a straight line to the north-eastern beacon of the farm Fort Martin; thence along the eastern boundary of that farm to its south-eastern beacon; thence due south to the Umfuli River and down that river to the first-named point.

36. NORTON SIDING.

An area bounded by a line drawn from the junction of the Gwibi and Hunyani Rivers, along the eastern boundary of the Hunyani Estate; thence along the northern and western boundaries of Railway Farm No. 29 and the eastern boundaries of Railway Farm No. 28, Makwiro Source and Ardmore; thence in a straight line to the north-eastern beacon of the farm Fort Martin; thence along the eastern boundary of that farm to its south-eastern beacon; thence due south to the Umfuli River and up that river to its junction with the Doranango; thence up this river to the western boundary of the Mondoro Reserve and along the boundary of this reserve to the Ngesi River; thence up this river to the south-western beacon of the farm Christiana and along the southern boundaries of that farm, Phillipsdale, Glengarry and Adelina; thence along the eastern boundaries of the latter, Mexico and Revelant to its northern beacon; thence northwards to the old Charter-Salisbury road and along this road to the Hunyani River; thence down this river to the point first named.

37. HUNYANI TANK.

An area including the following farms; Lowlands, Gordonias, Aberdeen, Rietbuck Outspan, Herren Hausen, Saffron Waldron, Riverside, Lyndhurst, Kilworth, Porta Outspan and Clement's Plot.

38. 1645½ PEG, B. & M. & R. RAILWAYS.

An area including the farms Warwickshire, Sublime, United, Stonehurst, Somerby, Spitzkop, Doornfontein, Sunnyside and Lilfordia.

39. SALISBURY A.

An area, with access to Salisbury, comprising the following farms: Ingleborough, Lowdale, Eskbank, Calgary, Oldbury, Komani, Thornpark, Thetford and St. Gerera.

40. SALISBURY B.

An area comprising the following farms: White Cliff, Parkridge, western half of Fontainbleu, Heany, Oatlands, Amalinda, Ingwe, Willowvale, The Rest, Langford and Saturday Retreat.

41. SALISBURY C.

An area, with access to Salisbury, bounded by and including the following farms: Henricksen, Bluff Hill, Tynwald, eastern half of Fontainbleu, Lochinvar, Makabusi Outspan, Hopley, Odar Outspan, Longlands, St. Mary's, Idlesleigh Extension, Harveydales, Twentydales, Glenwood, Adelaide, Ventersburg, Epworth, Hatfield, Prospect, Waterfall, Warren and Mabel Reign.

42. SALISBURY D.

An area, with access to Salisbury, bounded by and including the following farms: Pote, Balkize, Willesdon, Sussexdale, Welston, Teviotdale, Pomona,

Rietfontein, The Nursery, Greendale, Reserve, Donnybrook, Dispute, Sebastopol, Caledonia. Father Hartmann's farm, Chishawasha, Stuhn, The Springs, The Grove, Umritsur, Borrowdale Estate, Thelksindi, and the Chindamora Reserve.

43. ARCTURUS.

An area consisting of the following farms: The Craig, Kilnmuir, The Meadows, Mount Shannon, Halstead, Bally Vaughan, Saratoga, Marsala, Frascati, Strathlorne, Ivordale, Devonla, Rudolphia, Thornvlei, Alderley, Learig, Gilnockie, Gardiner, Mabfen, Retreat, Guernsey, Grazeley, Lonely Park, Chinyika, Orion, Reserve, Colga, Oribi, Ivanhoe and the Chikwaka and Msana Reserves.

44. BROMLEY SIDING.

An area bounded by and including the following: Kunzwi Reserve, farms Kinahan, Rochester, Belvedere, Bellevue, Belmont, Ruwa, Bain's Hope, James, The Glebe, Galway Estate, Deanesbrook, Nalira Reserve, Buenavista, Seki Reserve, Shiota Reserve, Great Bromley Estate and Weardale.

45. MARANDELLAS NORTH.

An area including the following farms: Musi, Peddie, Southampton, Roraima, Essexvale, Rockery, Progress, that portion of Lendy north of the railway line, Longlands, Shortlands, Loquat Grove, Helm, Cotter, Rapid, Revolt, Rokodzi, Springvale, Retreat, Pirate, Bovey Tracey, March, Rocklands, Forest Range, Cornwall, Somerset, Dorset, Buckingham, Sunny Fountains, Mangwendi Mission, Tiller, Rapture, Warwick, Cambridge, Nandu, Argosy, Rupture, Dormervale, Oxford, Norfolk, Surrey, Sussex, Suffolk, Kent, Middlesex.

Note.—Access will be granted for ox transport from the above-described area on to Uplands subject to the condition that no such wagons be outspanned on the south side of the railway.

46. MARANDELLAS SOUTH.

An area bounded by a line drawn from the most northerly beacon of Gatzi, along the western boundaries of that farm and Nolans, and the southern boundaries of Retreat, Springvale, Rakodzi, Longlands, and from the southernmost beacon of that farm along its western boundary to the railway; thence westwards along the railway to where it enters Peddie; thence along the eastern and south-western boundaries of Musi, and the western boundaries of Hedon, Stow, Nungubi Mission, Rhodesdale, Poltimore, Endsleigh, Chudleigh, Bickleigh, Saltash and Balmoral, and from the south-west of Balmoral along the western boundaries of Corfe, Vergenoeg and Good Hope to the Sabi River, and thence down that river to its junction with the Macheke River, up the latter to the Rusawi River; thence up the Rusawi River to the farm Tweedjan; thence along the eastern boundaries of Tweedjan, Nyakurwi, Elandslaagte, Summerslust, Delta, Soshwi Reserve, De Ay, Boom, Ta-ra-ra, Nolans and Gatzi, to the point first-named.

Note.—Access will be permitted for draught oxen from the transport area immediately to the north of that herein described on to Uplands, provided such wagons are outspanned only to the north of the railway.

47. MACHEKE STATION.

An area bounded by a line drawn from the north-western beacon of Showers, along the western boundaries of Showers, Gongwe, Magar, northern and western boundaries of Highlands, north-western and south-western boundaries of Allen, western boundary of Holton Estate, western and southern boundaries of Belmont Outspan, north-western boundary of White Gombola, western boundaries of Bonn, Calne, Wilton, western and southern boundaries of The Cave, and the southern boundary of Mere; thence up the Macheke River to the north-western beacon of the Monte Cassino; thence along the southern and eastern boundaries of Monte Cassino to its most northern beacon; thence in a direct line to the south-western beacon of Changwe Rancho No. 1; thence along the southern and eastern boundaries of Changwe Rancho No. 1 and the north-eastern boundary of Changwe Rancho No. 2 to the Mafuri River; thence down this river to the eastern boundary of

this territory; thence along this boundary in a northerly direction to the Mazoe River; thence up this and Inyagui Rivers to where the latter enters the Marandellas North area; thence in an easterly direction along the boundary of this area to the north-west beacon of Showers.

48. HEADLANDS STATION.

An area bounded by the Umfuri River from where it intersects the north-eastern boundary of Changwe Ranche No. 2, down the Umfuri to its junction with the Ruanya River; thence in a southerly direction up this river to the north-eastern corner of Rathcline; thence along the northern boundary of Rathcline, and the northern and western boundaries of the Inyati block to the south-eastern beacon of Trelawny; thence along the southern boundary of Trelawny; thence in a direct line to the north-east beacon of Nyamangura; and along the eastern boundaries of that farm and Maringowie; thence in a direct line to the north-eastern beacon of Lone Kop; thence southwards and westwards along the boundaries so as to include the farms Lone Kop, Moodie's Vale, Emerald, Netzewa, Leuwpoot, Lesbury and The Willows; thence up the Macheke River to the southern beacon of Monte Cassino; thence along the southern and eastern boundaries of that farm and from its most northern beacon in a direct line to the south-western beacon of Changwe Ranche No. 1; thence along the southern boundary of Changwe Ranche No. 1 to the eastern boundaries of Changwe Ranches Nos. 1 and 2 to the first-named point.

49. JUNCTION, MAZOE AND LOMAGUNDI RAILWAYS.

An area comprising the following farms: St. Marnock's, Kinvarra Haydon, Good Hope, Stamford, Gillingham, Rainham, Outspan, Homefield, Stapleford, Glenlussa.

50. 23-MILE PEG, LOMAGUNDI RAILWAY.

An area including the following farms: Derry, Penrose, Killimore, Inkomo, Dryham, Syston, The Lily, Ballineety, Bitton, Doynton, Yate, Sandringham, Sandown, Nauweplaats, Outspan, Mooi Leegte, Jackal's Loop, Sandhurst, Warley, Umvukwe Oog, Oakwoods, Goede Hoop, Oodekraal, Kleinkopjes, Leuww's Rust, that portion of the Barwick Estate within the native district of Mazoe.

51. PASSAFORD STATION.

An area consisting of the farms Umsasa, Mbeki, Springvale, Passaford, Estes Park, Spa, Fairview, Weltevreden and Makay.

52. 35-MILE PEG, LOMAGUNDI RAILWAY.

An area including the following farms: Cardiff, Wellesley, Sodbury, Kingswood, Greenside, Oldlands, Pucklehills, Little England, and the Gwibi Reserve.

53. GWIBI TANK HALT.

An area including the following farms: Darwerdale, Hunyani Estate, Gwibi Junction, Eclipse block, Dowend, Charfield and Fish Ponds.

54. BANKET, LOMAGUNDI.

An area lying to the south and east of a line drawn from the north-eastern corner of the Umvukwe Ranche, along the north and west boundaries of that property; thence to the north-western corner of Nzashoa, along its western boundary to the most westerly beacon of the Barwick Estate; thence to the junction of the Maquadzi and Mennini Rivers; thence to the 75 mile peg on the Banket-Aryshire Railway; thence westward to the northern beacon of Glenluce and along its northern boundary to the Msenge River; thence up the Msenge and Doondo Rivers to the source of the latter; thence to the Kanumbgwi Hill; thence westward to the Hunyani River and up that river to the Hunyani Estate; thence in a northerly direction along the north-west boundaries of the Gwibi Tank Halt, 35 mile peg Lomagundi Railway, 23 mile peg Lomagundi Railway, and Mazoe areas to the point started from.

55. ELDORADO, LOMAGUNDI.

An area bounded by a line drawn from the north-eastern corner of

Umvukwe Ranche along the north-western corner of Nzashoa along its western boundary and to the western beacon of the Barwick Estate; thence to the junction of the Maquadzi and Mennini Rivers; to 75 mile peg on the Banket-Ayrshire Railway; thence westward to the northern beacon of Glenluce and along its northern boundary to the Msenge River; thence up the Msenge and Doondo Rivers to the source of the latter; thence to the Kanumbgwi Hill; thence westward to the Hunyani River and up that river to Hunyani Poort; thence along the northern boundary of the Gadzema Station boundary to the Umfuli River; thence down this river to the Zambesi River; thence along the northern boundary of this territory to the Umsengesi River; thence up this river and the Utete River to its source, and thence in a direct line to the point started from, excluding Reynardia.

56. SELBY SIDING.

An area comprising the following farms: Madzugetu, Mount Hampden Reserve, Bendauch, Glengara, Mgutu, Mayfield, Patterson, Selby, Pearson Settlement, Sigaro, Nalire.

57. MAZOE.

An area lying north of a line drawn from the south-western beacon of Moore's Grant along the southern boundaries of that estate; thence along the western and southern boundaries of the Howick Estate and Burley Bottom to the north-western beacon of Belford Estate No. 2; thence along the western and southern boundaries of Belford Estate to the westernmost beacon of Springvale; thence along the north-western boundary of Springvale, the western, northern and eastern boundaries of Msasa, the eastern boundaries of Mabebi and Springvale to the western boundary of Great B.; thence along the western, southern and eastern boundaries of Great B. to the southernmost beacon of Arnold's; thence in a line east to the western beacon of Pote; thence along the northern boundary of that farm to the Poorte River, down the Poorte River to the south-eastern beacon of Gosforth; thence along the eastern and northern boundaries of this farm, the eastern boundary of Avonduur, the southern, eastern and western boundaries of Geluk; thence following the western boundaries of the farms Simoona Reserve, Ireniedale, Dunmaglas, Duntarvie, and Makori; thence in a straight line to the western beacon of Chomkuti, along the western boundaries of that farm, Dunaverty, Lagnaka, Maparu and Hinton; thence down the Ruia River to the southern boundary of Lawley's Concession; thence following its southern and western boundaries, the western boundary of the Chiweshwe Reserve to its north-west beacon at Banalombizi; thence west in a straight line to the boundary of the Eldorado-Lomagundi area.

58. KIMBERLEY REEFS.

An area described by a line drawn from the south-eastern beacon of Gosforth; thence along the eastern and northern boundaries of this farm, the eastern boundary of Avonduur, the southern, eastern and northern boundaries of Ge'uk; thence following the western boundaries of the farms Geluk, Simoona Reserve, Ireniedale, Dunmaglas, Duntarvie and Makori; thence in a straight line to the western beacon of Chomkuti, along the western boundaries of that farm, Dunaverty, Lagnaka, Maparu and Hinton; thence down the Ruia River to the southern boundary of Lawley's Concession; thence following its southern and western boundaries, the western boundary of the Chiweshwe Reserve to its north-west beacon at Banalombizi; thence west in a straight line to the boundary of the Eldorado-Lomagundi area; thence along the boundary of this area in a northerly direction to the boundary of this territory; thence in a south-easterly direction along this boundary to the Mazoe River; thence up the Mazoe River to the junction of the Inyagui; thence up the latter to the eastern beacon of the Msana Reserve; thence along the northern boundary of that reserve to Mount Murgive Masimbi; thence along the southern boundaries of the Farms Nabgwe, Ceres, Woodlands, Hereford and The Vale; thence in a northerly direction from the south-western beacon of The Vale to the north-western beacon of Bonny, following up the course of the Poorte River to the first-mentioned point, *i.e.*, south-eastern beacon of Gosforth.

59. ESSEXVALE AND BALLA BALLA AREAS

An area bounded by and including the following farms: Glen Grey, Bushy Park, Napier's, Springvale, Mzingwani Reserve, Worringham, Hilton, Ballarat, Essexvale, Glen Lategan, The Range, Clarke's, Swaithe's, Limerick, Pioneer's Rest, Hayhill, Rietfontein, Blagdon, Fairview, Hamilton, Mayfair, Rathline, Westondale, Outspan No. 2 Belingwe Road, Spitz Kop, and Yazani.

60. STANMORE SIDING AREA.

An area bounded by and including the following farms: Longfield, Lynch's, Irisvale, New Brighton, Charter, Penalverne, Rhodesia Limited No. 2, Glass block, Railway block No. 1, Lendy's, Hollins' block, Draaispruit, Zwemele block, Leilavale; thence from the eastern beacon of Kozi in a direct line to the south-west beacon of Absent to its north-eastern beacon; thence along the southern boundary of Essexvale to the western beacon of Glen Lategan; thence along the western boundaries of Glen Lategan and the Range to the farm Longfield.

61. FILABUSI AREA.

An area bounded by and including the following farms: Outspan, Doornboom, Bele, Buffelsfontein, Nyamini, Insiza, Manzanmyama Reserve, St. Andrews, Panasequa, Eldorado, Fairgrove, Folley's Luck, Amazon, Mosen-thal's, Chelo, Cala, Xalanga, Bolo, Scott's Hope, Lions' Lair, Honeyvale, Wallaceville, Comyn Dell, Tandasui, Luttrell's Town (north and south), Mivele, Tsomo, Xuka, Uyanezi, Inyezi, Leeuwhook, Ingwenya, Hillside, Fernkloof, Itaga, Krantzklloof, Grasspan, from the latter down the Buby River to the north-east beacon of Lubisi; thence along the northern boundaries of Lubisi, Inanda, Hluku, Vukwe, Bangwe, to the most easterly beacon of Outspan.

No. 50 of 1912.]

[8th February, 1912.

AFRICAN COAST FEVER.

Regulations regarding the movement of cattle and the prevention and suppression of disease.

I. **U**NDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 329 of 1910 and 308 of 1911 and make the following provisions in lieu thereof:—

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

General Movement.

3. For the purpose of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission:—

- (a) Single farm.
- (b) Two or more adjoining farms, farmed together under one management and situated within one cattle transport area.
- (c) An area, the property of one owner, enclosed by a substantial fence.
- (d) For grazing purposes, an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land.

The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease, or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission, in writing, of an Inspector, Sub-Inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall permit the movement of cattle

- (a) Without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the district over which land or reserve such cattle will pass, whether along roads or otherwise; provided, however, that refusal to grant such consent shall be in writing, and provided further that if the Controller of Stock or the Chief Inspector shall consider that such consent is withheld without good and sufficient cause he may permit of movement without such consent.

If any such person mentioned above refuse to give consent or to state a reason for refusing to do so in writing, no valid objection shall be deemed to exist and movement may be permitted without such written consent.

- (b) Within a veterinary district as defined in the schedule annexed hereto from one transport area to or through another without the consent of the Cattle Inspector in charge of such area.
- (c) From any veterinary district to or through another without the consent of the District Veterinary Surgeon of such district.

Slaughter Cattle.

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same except for the purpose of being slaughtered at the appointed abattoir, and if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock; provided, however, that the Chief Inspector may allow the removal of cattle from such an area under such conditions as he may prescribe.

Transport Cattle.

9. The use of cattle for draught purposes is prohibited except:—

- (1) Within the boundaries of the places defined in section 3, (a), (b) and (c) hereof.
- (2) Within the boundaries of areas already fixed for the use of cattle for draught purposes in terms of regulations published under Government Notice No. 329 of 1910, or such other areas as may be fixed by the Administrator.

10. Notwithstanding the provisions of section 9, no permit shall authorise the working of cattle

- (a) which are not clearly and distinctly branded with the registered brand of the owner;
- (b) in any wagon or vehicle which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

11. No wagon or other vehicle drawn by oxen shall be moved from one cattle transport area into another without the permission of the Cattle Inspectors concerned, and under such conditions as they may impose.

General Provisions.

12. On the outbreak or suspected outbreak of disease, the Administrator may declare an area of infection around and embracing the place of outbreak or suspected outbreak, and a further area or areas around such area of infection as a guard area, whereupon all movement of cattle into and from place to place within such area or areas shall be immediately suspended, except as is hereinafter provided.

A.—*In areas of infection and guard areas :—*

- (1) Cattle in transit by rail may be moved through such area.
- (2) Cattle from beyond the borders of Southern Rhodesia may be detained within such area or areas *en route* to destination.
- (3) Cattle for *bona fide* farming, dairy and slaughter purposes may be moved into such area or areas by permission of the Chief Inspector and under such conditions as he may impose.

B.—*In guard areas only :—*

Cattle may be moved into and from place to place within such area under the conditions of section 6 hereof.

13. The removal of green forage, hay, fodder, bedding reeds, manure or of such other articles as may reasonably be supposed capable of conveying infection, shall be prohibited from areas of infection, save and except with the special permission of the Administrator.

14. Whenever an area shall have been declared under section 12 hereof, every person within such area, or within such further area as may be specified by Government Notice, owning or in charge of cattle shall, upon the death or slaughter because of disease, suspected disease, or accident, of any such cattle, immediately report such occurrence through the nearest Cattle Inspector, Native Commissioner or Police Officer to the District Veterinary Surgeon.

15. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

16. Whenever an area shall have been declared an area of infection or guard area in terms of section 12 hereof, any person who shall allow any cattle to stray or be otherwise removed, except as provided for in these regulations, from any one place within such area to another place, or from a place outside of to a place within such area, shall be guilty of an offence against these regulations.

17. All cattle within the limits of the various commonages and townlands, areas of infection and guard areas as declared under section 12 hereof, or depastured on common grazing ground, shall be dipped or sprayed at least once in every three days, unless the Chief Inspector shall authorise the extension of the time between such dipping or spraying, or the entire suspension of the same.

18. In all areas of infection and guard areas sheep and goats shall be dipped at such periods as may be directed by the Chief Inspector.

19. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Chief Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

20. All permits for the removal of cattle issued under the provisions of the said Ordinance or of any regulations framed thereunder shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

21. No permit issued for the movement of cattle shall be taken to authorise any trespass in connection with such movement.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road,

public outspan, commonage, or any property other than that of the owner, unless they are free from ticks or unless they have been effectively cleansed by dipping, spraying or other process, within fourteen days of being allowed on such road or other place. Any beast having ten or more ticks on it shall not be considered free from ticks.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months,

SCHEDULE "A."

VETERINARY DISTRICTS OF SOUTHERN RHODESIA.

(1) *Salisbury.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

32. Battlefields; 33. Hartly and Gatooma; 34. Gadzema Station; 35. Makwiro Station; 36. Norton Siding; 37. Hunyani Tank; 38. 164½ Peg B. & M. & R. Railways; 39. Salisbury A.; 40. Salisbury B.; 41. Salisbury C.; 42. Salisbury D.; 43. Arcturus; 44. Bromley; 45. Marandellas North; 46. Marandellas South; 48. Headlands Station; 49. Junction, Mazoe and Lomagundi Railways; 50. 23-Mile Peg, Lomagundi Railway; 51. Passaford Station; 52. 35-Mile Peg, Lomagundi Railway; 53. Gwibi Tank Halt; 54. Banket, Lomagundi; 55. Eldorado, Lomagundi; 56. Selby Siding; 57. Mazoe; and 58. Kimberley Reefs.

(2) *Bulawayo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

1. Plumtree; 2. Marula Siding; 3. Figtree; 4. Westacre Junction; 5. Bulawayo Area; 6. Hazaney Junction; 7. Bembesi Station; 8. Insiza North; 9. Insiza South; 10. Shangani North; 11. Shangani South; 14. Redbank; 15. Nyamandhlovu Station; 16. Malindi Station; 17. Wankies Area; 18. Matetsi Siding; 19. Matopo Terminus; 20. Sabiwa Siding; 21. Gwanda Station; 22. West Nicholson; 23. Belingwe; 59. Essexvale and Balla Balla Areas; 60. Stanmore Siding Area; 61. Filabusi Area.

(3) *Gwelo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

12. Somabula Siding; 13. Gwelo Station; 24. Selukwe Area; 25. Surprise Area; 26. Indiva Siding; 27. Lalapanzi; 28. Iron Mine Hill Siding; 29. Umvuma Siding; 31. Que Que Station.

(4) *Umtali.*

An area comprising the native districts of Umtali, Masetter, Makoni and Inyanga.

No. 70 of 1912.]

22nd February, 1912.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," and in terms of section 12 of Government Notice No. 50 of 1912, I do hereby declare the following area of infection and guard area:—

(a) *Area of infection.*

Farm Collaton, in Matopo native district.

(b) *Guard area.*

Farms Honeybird Kop, Doublevale, Maritzburg, Springvale, Vreigevicht and Outspan No. 3 Tati Road.

No. 71 of 1912.]

[22nd February, 1912.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Amending Ordinance, 1911," I do hereby declare the under-mentioned farms as areas actively infected for the purposes of the said Ordinance:—

Collaton, Honeybird Kop, Doublevale, Maritzburg, Springvale, Vreigevicht and Outspan No. 3 Tati Road (within the native districts of Bulawayo, Matopo and Bulalima-Mangwe).

No. 105 of 1912.]

[28th March, 1912.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 281 of 1910, and in terms of section 12 of Government Notice No. 50 of 1912, do amend Government Notice No. 59 of 1912 as follows:—

1. Native Districts of Umzingwani, Bulawayo, Matopo and Bubi—

(a) (3) The farms Springs, Hope Valley and Duncal are declared to be no longer an area of infection.

2. Goromonzi district—

The words "Salisbury Commonage" are transferred from the description of the guard area to that of the area of infection.

3. Melssetter district—

The following area is substituted in lieu of that prescribed therein as a guard area—

"An area bounded by the Anglo-Portuguese border on the east, and by and including the following farms on the west:—Weltevreden, Riverange, The Drifts, Cambridge, Zaaipplaats, Nyaruma, Nyhodi, Bloemhof and the Ingorime Reserve No. 1."

AFRICAN COAST FEVER.

DIPPING OF CATTLE.

IT is hereby notified for the information of cattle owners concerned that, with a view to limiting the danger from African Coast Fever infection, it is intended to make provision for the regular dipping of all cattle within the following area:—

An area including parts of the native districts of Bulawayo, Umzingwani, Matopo, Bubi and Bulalima-Mangwe, bounded by and including the following farms:—

Lochard Block, Half Ration Ranche, Chilton, Fincham's, Robert Block, Induna, Waterfall, Dingaan, Rouxdale, Fundisi, Helenvale (excluding farms Nos 1, 3 and 16), Slights, Billars, Stoneycroft, Craiglee, Blewbonny, Millievale, Dewsbury, Joe's Luck, Honeybird Kop, Double Vale, Maritzburg, Springvale, Outspan No. 3 Tati Road Vreigevicht, Anglesea, Excess, Mineral King, World's View, Matopo Block, Mission Farm Brethren in Christ, Absent, that portion of the Matopos lying north of a line drawn from the south-eastern beacon of Absent to the north-western beacon of Longfield, The Range, Clarke's, Swaithe's Limerick, Pioneer's Rest, Hayhill, Reitfontein, Bradford, Hamilton, Mayfair, York, Indina, Rathline, Westondale, sub-division A, Fochabers, Kodhwayo, Zimbile and Lochard Outspan.

Owners of cattle who do not possess tanks, or who are unable to arrange for the use of a tank, are requested to inform the Assistant Chief Veterinary Surgeon, Bulawayo, before 20th April, 1912, whether they are in a position to proceed at once with the erection of their tanks and complete same within reasonable despatch under the grant-in-aid system, or whether they wish tanks erected under the provision of section 15 of Ordinance 2 of 1911, which empowers the Government to erect tanks and charge the cost thereof on the owner of the farm.

The assistance and co-operation of cattle-owners concerned is urgently requested.

No. 59. of 1912.]

[8th February, 1912.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notices Nos. 142 of 1910, 14, 33, 106 and 154 of 1911, and also Government Notices Nos. 303 and 382 of 1911, except as is hereinafter provided, and in terms of section 12 of Government Notice No. 50 of 1912 declare the following areas of infection and guard areas for the purpose of the said Ordinance:—

1.—Native Districts of Umzingwani, Bulawayo, Matopo and Bubi.

(a) Areas of infection.

- (1) The south-western portion of Sauerdale and the south-eastern portion of Alnwick included in the same fence.
- (2) The farms Adams, Emangeni, Inyorka and Ballarat and that portion of Essexvale Estate known as the North Paddock which adjoins the farm Ballarat on its eastern boundary.
- (3) The farms Springs, Hope Valley and Duncal.
- (4) The fenced sub-division of Bulawayo Commonage which includes the Township, Suburbs and Hillside Township.
- (5) Induba farm.

(b) Guard area.

An area bounded by and including the following farms—Lochard block, Half Ration Ranche, Chilton, Fincham's, Robert block, Induna, Waterfall, Dingaan, Rouxdale, Fundisi, Helenvale (excluding farms Nos. 1, 3 and 16), Slughts, Billars, Stonycroft, Craiglee, Blewbonny, Millievale, Dewsbury, Joe's Luck, Klipspring, Irene, Lucydale, Bedza, Anglesea, Excess, Mineral King, World's View, Matopo block, Mission Farm Brethern in Christ, Absent, that portion of the Matopos lying north of a line drawn from the south-eastern beacon of Absent to the north-western beacon of Longfield, The Ranges, Clarke's, Swaithe's, Limerick, Pioneer's Rest, Hayhill, Reitfontein, Bradford, Hamilton, Mayfair, York, Induna Rathline, Westondale, sub-division A, Rochabers, Kodhwayo, Zimbile and Lochard Outspan.

2.—Goromonzi District

(a) Area of infection.

The farms Stamford, Homefield, Rainham, Gillingham, Outspan, Fontainbleu, Tynwald and Hayden.

(b) Guard area.

An area including the following farms:—Stapleford, Glen Lussa, Sunnyside, Doornfontein, Spitzkop, Whitecliff, Heaney, Parkridge, Willowvale, Lochinvar, Warren, Mabel Reign, Salisbury Commonage, Avondale, Zizalisari Outspan, Bluff Hill, Good Hope, Henrichsen, Mt. Hampden Reserve, Kinvarra, St. Marnock's, Thorn Park, Mt. Hampden Outspan, Komani, Arden and Gwibi Government Farm.

GOVERNMENT NOTICES

3.—*Umtali District.*

(a) *Area of infection.*

Umtali Commonage.

(b) *Guard area.*

An area bounded by a line drawn from the eastern beacon of Mab along its north-eastern and northern boundaries, thence along northern boundaries of Coldstream and Savillen and from the north-western beacon of the latter farm along its western boundary to Odzahi River, thence down this river to its junction with the C thence down the Odzi to the south-east beacon of Gilmerton, thence along the southern and eastern boundaries of the latter, the southern boundaries of Zimunga Reserve and Howth, the southern boundaries of Greendale, Scandania, Norseland and Valhall the Portuguese boundary, thence in a northerly direction along boundary to the first-named point.

4.—*Melsetter District.*

(a) *Area of infection.*

The farms Tilbury, Dunstan, Sauerombi and Lindley.

(b) *Guard area.*

An area bounded by the Nyanadzi River on the north, the Nykodi River on the east, the Lisitu River on the south, and including Ingo Reserve, Bloemhof, Cambridge, The Drifts and Welgegend.

5.—*Inyanga and Makoni Districts.*

(a) *Area of infection.*

An area bounded as follows:—From the railway bridge over the Lesapi River to the junction of the Lesapi and Chimbi Rivers, up the Lesapi to the southernmost beacon of the farm Chimbi, along the southern and western boundaries of Chimbi to the north beacon of the farm, thence to the north beacon of Not-got-'em-yet, thence in a straight line to the south-west beacon of Rathcline and along its southern boundary, thence in a straight line to Mounts Zewa and Baya and southward along the Anglo-Portuguese frontier to the Hwange River following the southern boundary of the Inyanga native district to the Nyatanda River, thence to the southern boundary of Makoni Reserve and along it to the southernmost beacon of Zonga Farm; thence along its southern boundaries to the eastern beacon; thence west to the Inyamapamberi River, down this to the north-western beacon of Tiny; thence along the eastern boundary of the Chiduka Reserve to the Lesapi River, up this to the railway bridge.

(b) *Guard area.*

An area comprising the native districts of Inyanga and Makoni, excluding (1) the area defined in (a) hereof, (2) the Headlands transport area as defined by Government Notice No. 11 of 1911.

The area set forth in Government Notices Nos. 303 and 382 of 1911 remain areas of infection for the purposes of the "Animal Diseases Amending Ordinance, 1911."

No. 35 of 1912]

[25th January, 1912

IMPORTATION OF PLANTS, ETC., REGULATIONS.

WHEREAS the insect pest known as San Jose or pernicious scale (*Aspidiotus perniciosus*, Comstock) has been discovered infesting nursery stock, fruit trees and other plants in the Province of Natal in the Union of South Africa.

Now, therefore, under and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that, from and after this date and until further notice, the introduction into Southern Rhodesia of any plant or plants, not being fruit, seeds, bulbs, cut flowers, vegetables or vegetable transplants, grown in the Province of Natal in the Union of South Africa is prohibited, unless special permission in respect of each consignment be first obtained from the Director of Agriculture, Salisbury, Southern Rhodesia.

No. 36 of 1912]

[25th January, 1912

BLACK QUARTER OR SPONZIEKTE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby withdraw the quarantine and restrictions placed on the farms mentioned in Government Notice No. 218 of 1911 in so far as they relate to the above-mentioned Ordinance.

No. 41 of 1912]

[1st February, 1912.

FENCING ORDINANCE, 1904.

UNDER and by virtue of the powers conferred upon me by the "Fencing Ordinance, 1904," I do hereby define the area as described hereunder to be a district for the purpose of the said Ordinance, and, in terms of section 4 thereof, bring the provisions of the said Ordinance into operation in the aforesaid district.

DESCRIPTION OF AREA.

That portion of the native district of Selukwe within the following boundaries:—

From the north-east beacon of the farm Depoto, along the eastern boundary of that farm and the farms Umcima, Adare, Selukwe Peak, Outward Bound, Pont Vaen and Ortner's to the south-eastern beacon of the latter; thence along the southern boundary of Ortner's and the eastern, southern and western boundaries of Brooklands, the western boundaries of Aberfoyle Block, Educational, Wall Close and Kanuck to the north-eastern beacon of the latter; thence along the northern boundaries of Kanuck, Divide, Educational, Safago, Tibilikwe and Depoto to the point first named.

No. 47 of 1912.]

[8th February, 1912.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby authorise the importation, from the United States of America, of cattle required for *bona fide* breeding purposes, provided, however, that such importation shall be subject to the provisions of Government Notice No. 110 of the 16th April, 1908, relating to the importation of cattle from the United Kingdom of Great Britain and Ireland.

IMPORTATION OF STOCK FROM THE PROVINCE OF THE CAPE OF GOOD HOPE.

IT is hereby notified for general information that no permits will be granted for the importation of cattle under Government Notice No. 110 of 1908, from that part of the Province of the Cape of Good Hope eastwards of the railway line from Port Elizabeth to Bethulie, *via* Cookhouse, Rosmead and Stormberg Junctions.

No. 96 of 1912.]

[21st March, 1912.

ESTABLISHMENT OF POUND AT GATOOMA.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Hartley, a Pound has been established at Gatooma, and is now available for the public use.

No. 51 of 1912]

[8th February, 1912

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the conditions of section 11 of Government Notice No. 25 of 1909 to be in force in the native district of Victoria for a period of two months from 11th February, 1912, and in the native district of Ndanga for a period of two months from date of this notice.

No. 203 of 1911.]

[15th June, 1911.

GAME LAW CONSOLIDATED ORDINANCE, 1906.

UNDER and by virtue of the powers conferred upon me by the "Game Law Consolidation Ordinance, 1906, I do hereby extend the provisions of Government Notice No. 40 of 1909, as amended by Government Notices Nos. 128 and 129 of 1909, for a further period of one year from the 30th June, 1911.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.
Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 160 of 1910 withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1911, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commongage or Townlands of Bulawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

[15th August, 1911.]

IMPORTATION OF STOCK FROM EUROPE.

IT is hereby notified for public information that, owing to an outbreak of Foot and Mouth Disease in Holland and Great Britain, the Union Government has published regulations prohibiting all importation of cattle, sheep and pigs from the Continent of Europe and Great Britain. Provision has, however, been made for the admission of animals already on board ship, subject to inspection and such conditions as the Minister for Agriculture may see fit to impose.

No. 353 of 1911.]

[16th November, 1911.]

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby suspend the operations of sections 9, 10 and 12 of the said Ordinance until the 30th November, 1912, in regard to game in class "B," and the following game in class "C," viz.:—Eland, koodoo, zebra and Burchell's zebra or quagga, within the following area:—

DESCRIPTION OF AREA.

An area bounded by a line drawn from the junction of the Merowa and Umfuli rivers, up the Umfuli to its junction with the Susenje, thence up the Susenje and Massome rivers to the headwaters of the latter; thence to the drift where the Sinoia-Urungwe road crosses the Inyonga river; thence northerly along this road to the Chidzurgwe hill; and thence direct to the junction of the Merowa and Umfuli rivers.

No. 295 of 1908.]

[1st October, 1908.

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed existence of destructive diseases affecting the said animals in the said countries:—

- (1) All animals from the island of Mauritius.
- (2) All animals from German South-West Africa and all animals except donkeys from German East Africa.
- (3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.
- (4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.
- (5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingswilliamstown, Komgha, Peddie, Somerset East, Stockenström, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

(1) Plumtree shall be regarded as the port of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Office at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case

of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of Melsetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sawerombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about 2½ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape rods distant, bounded north-westwards by a line about 1,350 rods in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 rods in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary

line of the Penhalonga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I,
residing at
in the district of in the
..... Colony, do solemnly and sincerely
declare that the animals enumerated below are free from any contagious
disease, including scab, and have not been in contact with any infected
animals within six months from date hereof, and that to the best of my
knowledge and belief such animals in travelling to ... * Station
will not come in contact with any animals amongst which scab or any
other contagious disease has existed during that period; further, that
such animals were thoroughly disinfected by dipping on
and will enter Southern Rhodesia within ten days of having been
dipped.

And I make this solemn declaration conscientiously believing the same
to be true.

Declared to at on this day
of before me.

Resident Magistrate, Government Veterin-
ary Surgeon, Scab Inspector, or Police Officer
of district from which animals are being
sent.

Number and general description of animals being sent

Owner's name and Address

Place in Southern Rhodesia to which animals are being sent

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION I, GOV- ERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my
opinion, free from any destructive disease, including scab, and to the
best of my knowledge and belief have not been in contact with any in-
fected animals nor come from, or through, a locality where any such
disease is known to exist or has existed for twelve months from date
hereof.

Date

Place

Signature of Government Veterinary Surgeon.

Number and general description of animals..... Pigs, Sheep,
..... Goats.

Place from which animals are to be sent

Owner's Name and Address

Place in Southern Rhodesia to which it is desired to send the animals
.....

No. 110 of 1908.]

[16th April, 1908.]

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
- (2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
- (4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.
- (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcasses thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.
- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—

- (1) Importation shall be through and direct from the Coast Ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
- (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour

for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
 2. Number and Class of cattle to be imported.....
 3. Area or Farm and District where Cattle are at present located.....
 4. Area or Farm and District to which Cattle are to be moved.....
- Applicant's Signature.....
- Date
- Application
- Permit No.

ANNEXURE "B."

I,.....
 residing on the farm
 in.....do solemnly and sincerely
 declare that the..... (number in
 writing) animals also enumerated below have been in my possession since
 birth, and that lung-sickness, pleuro-pneumonia or other contagious or
 infectious disease has not existed amongst any of my cattle, nor on my farm,
 nor among any cattle with which these animals have been in contact within
 the last four years, and that these animals have never been exposed for sale
 in any public market or stock fair, nor been in contact with strange cattle,
 and that to the best of my knowledge and belief such cattle in travelling to
Station (i.e., station where cattle are to be
 trucked) will not come into contact with any animals amongst which lung-
 sickness or any other contagious or infectious disease has existed during that
 period.

Number of Animals.....Bulls.....Heifers.....
 Breed.....

Seller's Name and Address.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at.....on this.....
 day of.....before me,

Resident Magistrate for the district of

No. 60 of 1909.]

1st April 1909

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal Government Notice No. 124 of 1908, and do hereby declare and make known that, notwithstanding anything to the contrary elsewhere provided, the importation of cattle for bona fide slaughter purposes may be permitted into the Umtali district from the adjoining Portuguese territory, under the following terms and conditions:—

- (1) The importation and disposal of cattle, introduced in terms of these regulations, shall be under the absolute control and direction of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.
- (2) The importation shall be by rail only, and all cattle shall be de-trucked at the slaughter enclosure and immediately confined therein.
- (3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."
- (4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.
- (5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.
- (6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.
- (7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

No. 211 of 1910]

[4th August, 1910.

IMPORTATION OF CATTLE FROM NORTH-WESTERN
RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

- I. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

- (a) the districts from which they come and through which they pass are free from contagious diseases of animals;
- (b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for.

ANNEXURE "A."

Certificates under Section 3.

(a) I certify that I have examined the following cattle belonging to Mr.

.....cows and heifers,
calves,
oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....
 Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr.

.....cows and heifers,
calves,
oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....
 Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

No. 223 of 1910.]

[18th August, 1910.

IMPORTATION OF ANIMALS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of animals and dogs from the following countries:—

Persia
 British Burmah
 Assam
 China and bordering countries, including Korea
 French Indo-China
 Dutch East Indies
 Hong Kong
 Federal Malay States
 The Philippines
 Zanzibar

and all other countries where surra is known to exist.

No. 79 of 1910]

[7th April, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby direct that all cattle found within an area of twenty miles of the Crocodile River, in the native districts of Tuli and Chibi, in contravention of the provisions of Government Notice No. 47 of the 10th March, 1910, shall be forthwith destroyed.

No. 254 of 1910.]

[22nd September, 1910.

SOUTHERN BOUNDARY.

UNDER and by virtues of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

1. All cattle within an area of twenty miles from Shashi and Ramaquabane Rivers in the native districts of Tuli-Manzamyama and Bulalima-Mangwe, save and except westwards of the south-eastern boundary of the Mphoeng's reserve, shall, within one month from date hereof, be removed therefrom by the owners to such place or places as shall have been approved by the Native Commissioners of the said native districts respectively.

2. The introduction of all cattle into the aforesaid area is prohibited.

3. Any person refusing or neglecting to remove cattle from the area, as herein provided or introducing cattle into such area, shall be liable to the penalties provided by the aforesaid Ordinance, and all cattle found in the said area in contravention of this Notice shall forthwith be destroyed.

No. 51 of 1911.]

[16th February, 1911.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend section 1 of the Regulations published under Government Notice No. 254 of 1910, by omitting the words "an area of twenty miles from the Shashi and Ramaquabane Rivers," and substituting the words "an area bounded by a line from the junction of the Shashi and Shashani Rivers and continuing up the former river, following the borders of the Territory to the most southern beacon of Mphoeng's Extension Reserve, thence along the eastern boundary of the Reserve to a point shortly south of the south-west beacon of the farm "Lewisdale," thence south-easterly and easterly along a demarcated line to the junction of the Bulawayo-Macloutsi road and Bulawayo-Tuli old road, and thence along the latter to the Shashani River and down this river to the starting point."

No. 391 of 1908]

[17th December, 1908

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdrew the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

- i. Off Neck or Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

- i. Off Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

- i. On Near Side or Ribs;
- ii. Near Rump (or Thigh);
- iii. Off Shoulder;
- iv. Off Side or Ribs;
- v. Off Rump (or Thigh).

(d) In the case of ostriches:—

- i. On Near Thigh;
- ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette".

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show

that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

No. 45 of 1909]

[13th March, 1909

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 223. of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcasses of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

No. 336 of 1911

[26th October, 1911

RABIES.

THE following instructions regarding the treatment of persons bitten by rabid animals are published for general information.

In every case where a person has been bitten by a dog or other animal known, or suspected, to be rabid the following precautions are recommended:

- (1) The wound should be immediately and thoroughly cauterized. This, if it does not altogether prevent the disease, delays its onset sufficiently for Pasteur treatment to be successfully applied.
- (2) The patient should be sent to Salisbury for treatment at once. Delays are dangerous.
- (3) The fullest information should be sent to the Health Department as to date when bitten, locality, fate of dog, and especially reasons for supposing the dog to be mad.

No. 363 of 1911

[30th November, 1911

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provision of section II of Government Notice No. 45 of 1909 to be in force in the native district of Victoria for a period of three months from the 11th of November, 1911.

No. 365 of 1911

[30th November, 1911

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of clause II of Government Notice No. 45 of 1909 to be in force over an area within a radius of 15 miles of the Shamrock Mine, situated in the Gwelo district, for a period of six weeks from date of this notice.

No. 385 of 1911.]

[21st December, 1911.]

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of clause 11 of Government Notice No. 45 of 1909 to be in force in the native district of Mrewa for a period of six weeks from date hereof.

No. 386 of 1911.]

[21st December, 1911.]

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of clause 11 of Government Notice No. 45 of 1909 to be in force in that portion of Insiza native district lying south of the railway for a period of six weeks from date hereof.

No. 389 of 1911.]

[28th December, 1911]

SLAUGHTER AREA, VICTORIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the area in Schedule "B" of Government Notice No. 295 of 1908, set apart for depasturing and quarantining of animals for slaughter at Victoria.

No. 240 of 1910.]

[1st September, 1910.]

INSECT PESTS.

UNDER and by virtue of the powers vested in me by the "Nurseries Ordinance, 1909," I hereby proclaim the undermentioned insects to be pests within the meaning of the said Ordinance:—

The Red Scale (*Chrysomphalus aurantii*)
 The Oleander Scale (*C. hederae*)
 The Circular Purple Scale (*C. aonidium*)
 Ross's Black Scale (*C. rossi*)
 The Purple or Mussel Scale (*Lepidosaphes beckii*)
 The Long Scale (*L. gloverii*)
 The White Peach Scale (*Aulacaspis pentagona*)
 Woolly Aphis or American Blight (*Schizoneura lanigera*).

No. 309 of 1909]

[30th December, 1909]

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from oversea, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expense of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

No. 306 of 1911.]

[15th October, 1911.

IMPORTATION OF PLANTS, ETC., REGULATIONS.

WHEREAS the insect pest known as San Jose or pernicious scale (*Aspidiotus perniciosus*, *Comstock*) has been discovered infesting nursery stock, fruit trees and other plants in the Transvaal Province of the Union of South Africa.

Now, therefore, under and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that, from and after this date and until further notice, the introduction into Southern Rhodesia of any plant or plants, not being fruit, seeds, bulbs, cut flowers, vegetables or vegetable transplants, grown in the Transvaal Province of the Union of South Africa is prohibited unless special permission in respect to each consignment be first obtained from the Director of Agriculture, Salisbury, Southern Rhodesia.

No. 249 of 1908]

[27th August, 1908

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

Department of Posts and Telegraphs,

Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

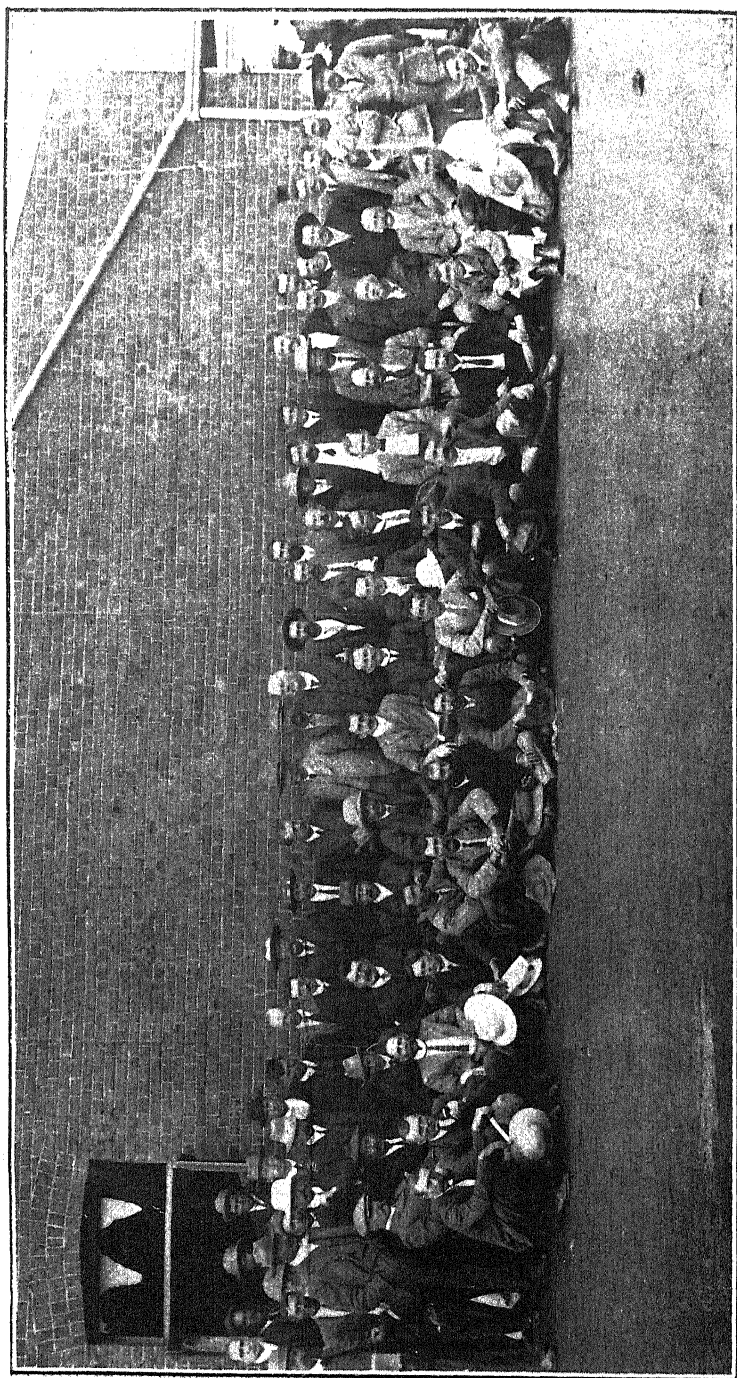
The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the bona fide produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EVRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.



Rhodesia Agricultural Union Congress of Delegates, Gwelo, April, 1912



THE RHODESIA
AGRICULTURAL JOURNAL.

*Edited by the Director of Agriculture
assisted by the Staff of the Agricultural Department.*

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Editorial.

Correspondence on subjects affecting the farming industry of Southern Rhodesia is invited. Enquiries will be replied to direct, or through the medium of the JOURNAL. An interchange of ideas and suggestions between farmers will be particularly welcomed. Contributions of a suitable nature for insertion in this JOURNAL will be much appreciated. All communications regarding these matters, and advertisements, should be addressed to the Editor, Department of Agriculture, Salisbury.

THE FARMERS' CONGRESS.—The annual meeting of the Agricultural Union took place at Gwelo from the 29th April to 2nd May. Apart from the main subject of consideration, the labour difficulty, there was a great number of resolutions discussed and carried. Some, in view of the overwhelming interest of this one topic, received rather scant consideration, which is to be regretted, as it is apt to convey the impression that the importance of these questions was not realised. The agenda was extremely long, but the chairman and delegates

remained at their task morning, noon and night, and long beyond the anticipated termination of the Congress, to thrash matters out. This meeting was the largest and most representative Congress yet held, and it is obvious that the Union is a growing influence and a very valuable one for the progress of the agricultural industry, and the co-ordination of the interests of individual farmers who spread out over the whole country, remote and often isolated, have little opportunity otherwise of comparing notes with their fellows. We congratulate Mr. R. A. Fletcher on his re-election as Chairman.

PURCHASE OF STOCK THROUGH THE DEPARTMENT OF AGRICULTURE.—We call attention to a notice published elsewhere detailing the terms on which stock is purchased through the Department in the South African Union. After a trial extending over two years, and which has proved generally satisfactory, it has been found possible to amend the system rendering it more favourable to farmers. The value of stock which may be purchased on extended terms of repayment has been increased from £75 to £200, whilst the deposit has been reduced from £5 and £1 to £1 and 5s. respectively for large and small stock. It is hoped that these alterations, and other changes detailed in the notice, will render this scheme even more effective than in the past.

SALE OF DIP THROUGH THE VETERINARY DEPARTMENT.—Arrangements have been come to with the firm of Messrs. Cooper Nephews, the manufacturers of cattle and sheep dip, for the sale of their new dipping fluid, after having been tested and satisfactorily reported upon, through the officers of the Veterinary Department, at the specially low price of 5s. per gallon for cash. Full details of the scheme, whereby farmers are enabled to effect a considerable economy in this item, will be found amongst our Departmental Notices. Remittances must accompany all orders which are forwarded through the District Veterinary Surgeon to the representatives of the firm, who send the dip to the nearest station or siding, as desired, free of charge, making the cost uniform throughout

the Territory. It is hoped that in this a thoroughly reliable and effective dip may be put within the reach of farmers at as low a price as possible.

DIPPING TANKS.—The number of private dipping tanks in Southern Rhodesia in use or in course of construction to-day is 190, whilst a large number of applications for grants-in-aid have been made, showing that this figure is likely to be materially increased before very long. It is obvious that the enormous advantage of having a dipping tank is now very generally realised. Regular dipping of all the livestock on a farm will do much to remove the danger of coast fever and to eradicate ticks, whilst dipping at irregular intervals at public dipping tanks of transport oxen or of other stock happening to have to pass the dip is comparatively useless.

The researches of Lt.-Col. H. Watkins-Pitchford, detailed at length in recent numbers of this Journal, have shown clearly that dipping will not prevent the spread of coast fever unless practised every seventy-two hours at least. The reason of this is, shortly, that the coast fever ticks spend from three to five days only on animals during each of the three stages of their existence. It is useless, therefore, to expect any protection against coast fever from a central tank in which cattle can only be dipped at very irregular intervals. The concentration of cattle at central public tanks is also not without risk of spreading disease, whilst of necessity tanks must be some distance from the larger number of the cattle in any district.

These considerations have influenced the Administration in its policy of encouraging private dipping tanks rather than increase the number of public tanks. At certain centres and in connection with outbreaks of coast fever public dipping tanks have been and will continue to be necessary and helpful, and there are in Rhodesia at the present time 25 such public dipping tanks in existence.

There are signs of a desire amongst certain sections for compulsory dipping, and although this seems difficult at the moment when about one farmer in ten possesses a tank and when white farmers only own one-third of the total cattle in the country, yet the matter is deserving of

consideration and discussion. A solution might be found on the lines of local option, already in operation as regards the fencing law.

THE LAND BANK.—We call the attention of all interested to the notice appearing in the public press with regard to the Land Bank, intimating that pending the appointment of a manager, applications may be forwarded to the Secretary, the Commercial Branch, B.S.A. Co., Bulawayo.

THE S.A. AGRICULTURAL UNION CONGRESS.—It is notified that from amongst the delegates from Rhodesia who attended the recent Congress of the South African Agricultural Union, held at Bloemfontein, Messrs. F. Eyles, M.L.C. and R. A. Fletcher were appointed members of the Standing Committee, and these together with Messrs. de Kock and Backhouse members of the General Committee.

FENCING IN RHODESIA. — The census returns, which however, in this respect cannot be regarded as very precise, give the amount of fencing on farms at 1st April, 1911, at 1,769 miles. Since then considerable private fencing has been erected, and about 250 miles in connection with African Coast fever, whilst along the railway 37 miles have been put up, making a total now of somewhat over 2,000 miles of fences.

BEE-KEEPING.—Referring to the interesting series of articles on apiculture at present appearing in the JOURNAL, we would bring to the notice of bee-keepers that the writer, Mr. F. Sworder, of Hallingbury, Hartley, is also the official expert for Rhodesia of the South African Bee-Keepers' Association, and is at all times prepared and willing to give advice or to answer any questions relative to the subject either through the correspondence pages of this Journal or direct. It is not often that the benefit of the knowledge of a recognised authority is to be had for the asking, so we commend this generous offer to all interested in bees.

THE LATE MR. J. CAMERON.—We regret to record the death of Mr. J. Cameron, Cattle Inspector at Lomagundi, who was well and widely known throughout Rhodesia, apart from his duties, for his knowledge of cattle and his personal interest in the improvement of stock.

He took great pains with the consignment of bulls brought out last year and distributed to farmers, and quite lately made a tour of inspection of a number of these to see how they were getting on in their new homes and to advise farmers on the subject. At one time he conducted this Journal.

Mr. Cameron was very popular wherever he went, and his loss is a severe one both to his friends and to the Department he so faithfully served.

CONTRIBUTIONS.—We would call special attention to the articles on tobacco culture, written by Mr. C. S. Jobling of Devonby, Nyamandhlovu, and Mr. J. Stewart Richardson, who superintends the operations of a number of tobacco growing estates in various parts of the country. Both writers have special claim to express their views which are the outcome of unique and prolonged experience of the subject in Rhodesia, and which should be of peculiar value to other growers and to beginners. We invite correspondence on this matter.

The descriptive account of the activities of the Liebig's Extract of Meat Company, written by the manager, Mr. de Laessoe, on their great cattle raising proposition in Tuli district, is also of special interest.

Results of Investigations in the Government Veterinary Laboratory, 1911

By LL. E. W. BEVAN, M.R.C.V.S., Government Veterinary
Bacteriologist.

EXAMINATION OF SMEARS AND PATHOLOGICAL SPECIMENS.

During the past year over 1,000 preparations from the field have been examined. The number is somewhat less than during the previous year, chiefly by reason of the methods adopted in dealing with outbreaks of African Coast Fever. Nevertheless, the Officers of the Veterinary Department and the public, realising the importance of the early detection of infective diseases, have readily availed themselves of this aid to diagnosis.

Fortunately, in the great majority of cases, the microscopic examination of blood and other smears has yielded negative results, but occasionally discoveries have been made which have repaid the time and labour expended. Not only are the common blood parasites of animals becoming familiar to us; but the morbid changes of the blood associated with them are now recognised and afford assistance in diagnosis when the parasite itself cannot be detected.

*Table of Pathogenic Micro-Organisms met with in preparations
from the field.*

Animal.	Micro-Organism.	Incidence.
Cattle ...	Theileria parva and Koch's bodies. Babesia bigemina ...	Occasional. Common in imported stock and occasionally in cattle from farms where frequent dipping has been practised. Also in local cattle suffering from some concomitant disease.

Animal.	Micro-Organism.	Incidence.
Cattle ...	<i>Anaplasma marginale</i> .	Very common—as with B., bigemina. Common among calves brought up in unhealthy surroundings.
	<i>Babesia mutans</i> ...	Rarely met with. Seen in one imported heifer inoculated with local virus.
	<i>Trypanosoma pecorum</i> (?)	Common in cattle in or from areas infested with <i>Glossina morsitans</i> .
	<i>Trypanosoma theileri</i>	Rare. Seen in one animal (calf).
	<i>Spirochaeta theileri</i>	Rare. Seen in two animals.
	<i>Sarcosporidia</i> ..	Met with in heart muscle of a Mashona cow.
	<i>Bacillus chauvoei</i> (?)	In cattle from Redbank and Insiza districts.
Equines ...	<i>Babesia equi</i> ...	Common in imported horses and donkeys.
	<i>Baccillus mallei</i> ...	Rare in imported horses and mules.
	<i>Cryptococcus rivoltæ</i>	Not seen during the year.
Sheep ...	<i>Trypanosoma pecorum</i> (?)	In two mules from Mafungabusi "fly" area.
	<i>Sarcosporidia</i> ...	In one case.
Dogs ...	<i>Babesia canis</i> ...	Very common.
	<i>Trypanosoma pecorum</i> (?)	In two dogs submitted to natural bite of <i>Glossina morsitans</i> .
Pigs ...	<i>Trypanosoma pecorum</i> (?)	One outbreak.
Birds ...	<i>Leucocytozoa</i> ...	In pheasants shot in "fly" belts.
	<i>Halteridia</i> ...	In a koraan.
	<i>Spirochaeta</i> ...	In domestic fowls. Common on premises infested by <i>Argas persicus</i> .

AFRICAN COAST FEVER.

During the early part of the year successful attempts were

made to transmit African Coast Fever by means of artificial inoculation with tissues from infected animals.

These experiments were originated with a view to arriving at a means of producing immunity, which had not previously been possible, by reason of the fact that the disease could not be transmitted by inoculation with infected blood.

On account of the danger of dealing with this disease at the Laboratory, situated as it is in a busy and heavily stocked centre, the experiments were necessarily few and restricted, so that when Dr. Theiler's report for the year 1911, came to hand, shewing that similar investigations had been conducted on a much more elaborate scale at Onderstepoort, it was thought advisable to discontinue the work.

On more than one occasion during the past year, preparations taken from sick calves, born and bred on an area upon which African Coast Fever had never previously existed, have shown Koch's bodies—which, it may be explained, are held to be diagnostic of the disease. These animals were grazing among cattle, which were apparently healthy at the time, and did not subsequently show any indication of the disease. In one instance, the discovery appeared so remarkable that the preparation was submitted to Dr. Theiler, who confirmed the diagnosis. In other cases, the Koch's bodies being more numerous, no doubt existed.

One other incident in this connection is worthy of record. The Chief Veterinary Surgeon, on visiting the infected farm "Rainham," took gland smears from a calf having a high temperature. These on examination were found to contain so many Koch's bodies that it was decided to obtain material from the animal with a view to using it for inoculation experiments. On visiting the farm two days later, the temperature of the calf (which had been strictly isolated), was found to be normal, and gland smears, having been prepared, were examined and found to contain no Koch's bodies or other indication of African Coast Fever.

In other cases, where undoubted African Coast Fever parasites have been found, they have disappeared for several weeks, to reappear with an acute form of the disease, from which the animal has succumbed.

The method of submitting preparations from the pre-scapula and pre-crural glands, has proved most successful in practice, and has been adopted not only by professional veterinarians, but by cattle inspectors and laymen. By this means a diagnosis may be based upon the presence of Koch's bodies, before the *T. parva* has made its way into the general circulation, and been taken up and transmitted by ticks engorging themselves with such infected blood.

Preparations from the glands have been found preferable to those taken from the spleen of the living animal; too frequently the latter contain no spleen substance, but only blood and fat which have been drawn up by the syringe from the cutaneous wound.

THE PLASMOSES OF CATTLE.

Under this heading it is proposed to discuss the diseases caused by *Babesia bigemina*, *Anaplasma marginale* and *Babesia mutans*.

At the commencement of the year, ten shorthorn heifers were imported from a non-redwater area of the Cape Colony, and were inoculated with blood taken from cattle in various parts of Mashonaland and Matabeleland, with the object of studying the incidence and virulence of the various blood parasites transmissible in this manner. Virus was collected from cattle in the Bulawayo District, Salisbury Commonage, Gwebi Reserve and Borrowdale areas of the Salisbury District and Umtali. All these animals reacted, and *Babesia bigemina* and *Anaplasma marginale* duly appeared in their blood. In one only *Babesia mutans* was encountered, and this was in one of the animals which subsequently died. It may be here pointed out, that No. 10 heifer was inoculated with blood from a calf at Borrowdale suffering acutely from Anaplasmosis, with its frequent complications, dysentery and pneumonia. *Babesia bigemina* was encountered in the heifer's blood on the eighth day after injection, and later *Anaplasma marginale*. It died of anæmia and cachexia on the 65th day.

At the same time, as a control experiment, a common native calf, bred in the Bulawayo District, was inoculated

with a similar quantity of the same blood. This animal's temperature rose suddenly on the 9th day, and *Babesia bigemina* appeared in its blood. The following day its temperature returned to normal, after which, parasites were not again encountered, the calf remaining healthy.

The experiment lends support to the contention, that many of the common calf ailments, which frequently assume the form of an outbreak, are of a secondary nature, the primary cause being faulty hygiene and the plasmoses, which lower the animal's resistance to invasion by micro-organisms, otherwise saprophytic. The information obtained from these experiments confirmed the pre-existing suspicion of the ubiquity of *Babesia bigemina* and *Anaplasma marginale*, and indicated that any method of conferring immunity, would have to embody these elements.

With the material thus available the endeavour was made to elaborate a polyvalent virus and to attenuate it by passage through suitable hosts. The progress of this work was tested upon a further eight susceptible heifers, and eventually a virus was obtained which produced a reaction, certainly severe, but within the limits of safety.

With this virus, some thirty imported animals were inoculated during the months of May, June and July. Two very delicate animals died during the reaction, the remainder are still alive. But about this time it was announced that Dr. Theiler had distinguished two varieties of *Anaplasma*, one variety which he termed *Anaplasma marginale*, and another which he called *Anaplasma marginale* (variety centrale). The latter variety was said to be of lower virulency, causing neither death nor serious lesions, but a certain degree of immunity against *Anaplasma marginale*, in so far that after recovery from *Anaplasma centrale* infection, *Anaplasma marginale* no longer caused death, or any serious illness.

This announcement following the discovery of the specific effect of Trypanblue upon *Babesia bigemina*, led to the hope that the difficulties associated with the immunising of imported animals were finally disposed of. It was all the more timely, in that shortly after there were due to arrive in Salisbury, some seventy head of pedigree stock from Great

Britain, all of which were to be inoculated, at Government risk, before distribution to farmers. To enable this to be carried out with the least possible risk, an animal was obtained from Dr. Theiler, which had been infected with *Babesia bigemina* and a pure strain of *Anaplasma centrale* virus. This was kept under tick-free conditions at the Laboratory.

On 17th July, 1911, the following animals from Great Britain were delivered at the Letombo Camp, which had been hastily fitted up as an inoculation station:—

15 Shorthorn bulls	}	Purchased to the order of the B.S.A. Company.
15 Hereford "		
15 Sussex "		
5 Hereford bulls	}	Purchased by private owners.
2 Hereford heifers		
7 Sussex bulls		
1 Red-polled bull		
1 Lincoln-red bull		
1 Shorthorn bull (bought privately) arrived later. Also		
4 Aberdeen-Angus bulls.	}	Privately imported.
1 Scotch Shorthorn bull		

These animals ranged in age between 1 year 6 months and 2 years, showing clear indications of fine breeding and pampering, circumstances which rendered the process of immunising all the more hazardous. Although the bulls had arrived without mishap, they were nevertheless very soft and footsore after their journey. As nothing is so detrimental to the chances of an animal undergoing this inoculation as an excessive deposition of adipose tissue, it was decided to postpone the operation for a week, during which time every endeavour was made to get the animals into a "firmer" condition by exercise and careful dieting. Now it must be pointed out that the greatest difficulty in connection with the process of conferring an attack of Plasmoses of standard strength is to keep the animals free from ticks throughout the period of reaction of the known virus; for should a single infective tick attach itself, the artificial reaction becomes complicated by a natural infection of unknown strength. It

is only those who have endeavoured to deal with ticks in a tick-infested country who can appreciate what it means to keep 67 bulls tick-free for the period of three months. Happily the months of July, August and September are at the end of the dry season, when the ticks are less plentiful than at any other time of the year. Nevertheless, the reality of the danger was shown in the case of the two Hereford heifers which, on being detrained, became excitable and unmanageable, breaking away on the veld, where they remained four days. They were brought in covered with ticks, and thereby contracted a natural infection, from which one died, and the other was saved only with the greatest difficulty. It became necessary, therefore, to clear a road from the railway to the Inoculation Station and to render the huts and Camp tick-free. Veld hay, that had been stacked for two years, was used for bedding, and food-stuffs likely to contain ticks had to be excluded from the dietary.

Certain food materials had been brought from England, but these had to be economised and gradually supplemented by local feeds, in order that when distributed the animals would take readily to Rhodesian feeds. Eventually the ration supplied to each animal per diem consisted approximately of 6lbs. green forage, 7 to 10lbs. kafir pumpkins or melons, 2lbs. linseed cake, and manna hay (a local millet) *ad. lib.* The total ration amounted to nearly 40lbs. per head per diem. But it must be pointed out that the feeding of the animals was by no means a mechanical process, but that each animal had to receive individual attention and a diet based upon its requirements.

The bulls were stabled in thirty round huts, made of raw brick and thickly thatched. Each hut was capable of housing two bulls. These huts were found far superior to the two brick stables roofed with galvanised iron, being cooler in the day and warmer at night. The even temperatures of the animals stabled in them were in marked contrast to the unsteady records of those animals stabled in the latter, a matter of great importance, as imported animals find the variations between the extreme heat of the day and cold at night very trying. At the Inoculation Camp it was found that a walk in the sun would often cause an elevation of temperature of two degrees (Fahr.) Now

that the animals are distributed, if they are allowed to travel long distances with the cows, it is feared they will suffer severely, especially as they will be getting their winter coats in the middle of the Rhodesian summer. The temperature of each bull was taken night and morning during the four months, and very valuable records have thus been collected. It is interesting to observe a certain similarity in the character of the charts according to the different breeds. Thus, when the records are set out on a long scroll one beneath the other in groups according to breeds, it is possible at a distance to distinguish the groups from the general appearance presented.

For example, in most of the animals of the Sussex breed a well-defined but constant difference between the morning and evening temperatures may be noticed, and experience has shewn that this "resilience" is indicative of constitutional vigour, for those animals in which it has been well marked have withstood the inoculation best. This observation applies not only to the chart as a whole, but especially to that portion of the record taken when the animal is suffering from either of the reactions. In those cases where the temperature has risen continually, the morning record being as high or higher than that of the night before, the animals suffered more severely than those whose temperatures may have been as high or even higher but have shewn a well marked "resiliency."

On the other hand, many animals showed what may be termed a "flat" reaction, and it is an interesting fact, that temperatures of the first type were chiefly met with in animals which were generally admired for their "points," probably impressed upon them by close breeding, but at a loss of constitutional vigour. Even among the Sussex, a breed which has been less tampered with for show purposes, certain animals which showed evidence of human interference, or as it would be called "improvement," could be detected by the "flatness" of their temperature records. In quite an appreciable number of cases, the reaction terminated by a sudden drop to a subnormal temperature, clinical symptoms ceasing. In others, a temperature of malarial type was presented. But in looking through these charts, it will be found difficult to determine the exact time occupied in the

completion of a cycle; this is perhaps accounted for by the fact that the temperatures were taken at irregular intervals, the morning record being taken between 7.30 and 8.30 a.m., and the evening record between 4.30 and 5.30 p.m., so that nine hours elapsed between the morning and evening taking and fifteen hours between the evening and morning. Thus it is possible that the completion of the cycle may have sometimes occurred undetected.

With costly animals at stake, any experiment involving a risk had to be avoided, and consequently an attempt could not be made to solve many of the problems which present themselves. The question as to the influence of the dose of a virus is one of these, some authorities maintaining that it is immaterial, others attaching considerable importance to the quantity of blood used. The bulls were inoculated with doses varying from 5 c.c. to 10 c.c., and from the charts it would appear that within these limits at any rate, the dose does not influence the reaction.

In reviewing the results by Dr. Theiler's virus, the reactions are found to vary with the different breeds, so that it is best to consider each separately. In the Shorthorns, the first reaction appears as a marked and regular curve extending from the fifth to the fifteenth day. But it is impossible from the temperature to define any well-marked period during which the second reaction was most active, as irregularities were liable to occur at any time between the 25th and 40th days, and recurrences between the 55th and 75th days. The reactions in the Sussex animals were marked by irregularities of temperature rather than by any continued elevation or well defined curves. These irregularities generally occurred between the fifth and fifteenth days for the first reaction, and the 25th and 60th days for the second. It was in this breed that the malarial or intermittent type of temperature was most noticeable. None of these animals were ever acutely sick.

The Hereford bulls reacted in a more regular and orthodox manner. The period in which the first reaction occurred was between the sixth and seventeenth days, and the second between the 30th and 50th days. The process of immunising was accomplished with the loss of but four animals.

1. Hereford heifer, which contracted natural veld infection.
2. One Shorthorn bull inoculated with Pretoria virus died with the first rise of temperature, probably from heart failure.
3. Two Shorthorn bulls inoculated with local virus died of anaplasmosis, biliary form.

In releasing the bulls as "salted" and exposing them to veld tick infection, we are relying implicitly upon our faith in Dr. Theiler's dicta, for in most animals the reactions have been so mild that it is difficult to realise that active immunity against such fatal diseases as red-water and gall-sickness, as we know them in this country, are caused thereby. There is a great element of risk also that the virus of the Transvaal may not "hold good" against the Rhodesian strains. Dr. Theiler writes in the *Transvaal Agricultural Journal*, 1905, p. 489, "it was seen that cattle immune against red-water in one part of the country might contract the disease when brought to another. It is common experience that cattle born and bred in the lowveld show strongest immunity. We can explain this by taking into consideration the fact that the ticks are most frequent in the warm low-lying regions. There seems also to exist a stronger virulency of the micro-organism in some parts of the country." From this it appears that the immunity is in relation to the severity of the infection. In a private letter to the writer Dr. Theiler says "We have different sorts of red-water, and one does not mean immunisation against another." There would, therefore, appear to be reasonable grounds for fear that the very mild reactions caused by the Pretoria virus may not have conveyed sufficient immunity to withstand natural infection in Rhodesia with what may prove to be a "different sort of red-water."

POST SCRIPTUM.—Since the distribution of the bulls, the "First Report of the Director of Veterinary Research," Department of Agriculture, Union of South Africa, for August, 1911, has come to hand. This contains an article by Dr. Theiler, detailing "Further investigation into Anaplasmosis of South African Cattle," and affords us for the first time authentic information as to the elaboration and powers

of the virus supplied and used by us. We herein read that "a recovery from an infection from *Anaplasma centrale* does not cause complete immunity." This may in part explain the fact that since the disposal of the bulls, and more especially since the onset of the rains—and, probably, the appearance of ticks in greater numbers—reports have been received from all sides of the sickness of the imported animals. In many instances this may be directly attributed to the careless treatment they have received, but in a considerable number of cases blood smears have shown that the animals have suffered from infection with *Anaplasma marginale*. Up to the present four animals have died, and these have presented most acute symptoms and extensive lesions of plasmosis.

It now remains to be shown by careful experiment and observation whether—

1. The virus from the animal received from the Onderstepoort Laboratory has died out.
2. Whether it has lost its power of conferring immunity.
3. Whether it confers immunity against local strains of virus.
4. Whether it is not desirable to fortify animals immunised with this virus against a polyvalent local strain, before submitting them to natural Rhodesian infection.
5. Whether the breakdown of immunised animals is due to infection with *Anaplasma marginale* alone or other complicating causes.

BABESIA MUTANS.

This organism has only once presented itself during the past year, namely, in one of the ten Shorthorn heifers imported from a non-red-water area of the Cape Colony and inoculated with Gwebi (Salisbury) virus. This animal alone, in addition to *Babesia bigemina* and *Anaplasma marginale*, revealed, on the 54th day after inoculation, *Babesia mutans* which increased in numbers until the 89th day when the

animal died. It is remarkable that from the 42nd day no anaplasmas were seen.

SPIROCHAETA THEILERI.

This has been met with in two cases only. Once in a Friesland heifer recently arrived from the Cape Colony and suffering from plasmoses locally contracted; and once in the following remarkable circumstances:—On 16th February, 1911, a blood smear was received from G. V. S. Williams taken from a calf on the farm "Warren," Salisbury District, in which was found a single giant trypanosome, resembling *Trypanosoma theileri*. Blood was taken from this calf, was citrated, and on receipt at the Laboratory was inoculated on the same day into one of the imported Shorthorns referred to in the previous section. Eight days after *Babesia bigemina* appeared in the blood, and after sixteen days, *Anaplasma marginale*. On March 29th, the calf, having died, was sent at once to the Laboratory. It was seen to be extremely emaciated, its skin was dry and showed extensive sloughs. Preparations made from the various organs were examined under the microscope, but no organism could be detected. Blood was taken from the heart and injected into the vein (10 c.c.) and under the skin (30 c.c.) of a Shorthorn heifer. No trypanosomes were ever seen in this animal, but, strange to relate, on the 7th day after the first injection and 34th day after the second *Spirochaetes* were encountered. These were in considerable numbers on that day (4th May), but disappeared on the following day and did not appear again. This Shorthorn was one of the ten previously referred to in connection with Plasmoses experiments, and although it was suffering from infection from *Babesia bigemina* and *Anaplasma marginale*, its clinical symptoms were entirely distinct from others similarly infected. By June 19th, the creature presented such a disgusting and miserable appearance that it was destroyed. It may here be remarked that *Trypanosoma theileri*, *Spirochaeta theileri*, as well as *Babesia mutans* and *Anaplasma marginale*, have each at different times been incriminated as the cause of the so-called "Gall-sickness" of cattle. The present case never showed any bilious symptoms to which such a name could have been applied.

HEIFER NO. 7 "B,"

Date.	No. of Days.	Morning Temperature	Remarks.
5-2-II			Arrived at Laboratory.
19-2-II		103.2	Inoculated 10 c.c. blood into vein and 20 c.c. under skin of blood from Warren calf, in which was found a Trypanosome.
20-2-II	1	102.2	
21-2-II	2	103	
22-2-II	3	102.2	
23-2-II	4	101.8	
24-2-II	5	101.6	
25-2-II	6	102.2	
26-2-II	7	102.4	
27-2-II	8	104.6	Babesia bigemina
28-2-II	9	101.8	
1-3-II	10	103.4	
2-3-II	11	101.4	
3-3-II	12	101.6	
4-3-II	13	103.6	Negative.
5-3-II	14	103.8	
6-3-II	15	104.2	
7-3-II	16	105.2	Anaplasmosis.
8-3-II	17	104	Anaplasmosis 30%.
9-3-II	18	104.2	
10-3-II	19	104.4	Anaplasmosis 33%.
11-3-II	20	103.6	
12-3-II	21	104.6	
13-3-II	22	102	Anaplasmosis 10%.
14-3-II	23	103	
15-3-II	24	101.8	Anapl; aniso; granulated rbc.
16-3-II	25	104.8	
17-3-II	26	102.8	
18-3-II	27	103.2	
19-3-II	28	103.6	
20-3-II	29	101.6	
21-3-II	30	101.8	
22-3-II	31	102.6	
23-3-II	32	102.4	Slight anaplasmosis.
24-3-II	33	102	
25-3-II	34	102	
26-3-II	35	102	
27-3-II	36	101.8	

HEIFER NO. 7 "B."—Continued.

Date.	No. of Days.	Morning Temperature	Remarks.
28-3-II	37	103.6	Anapl. aniso ; poikilo.
29-3-II	38	104	
30-3-II	39	101.6	
31-3-II	40	101.6	
			Anaplasmosis.
			Inoculated 10 c.c. blood tissue from Warren dead calf.
1-4-II	41	101.6	Babesia bigemina.
2-4-II	42	102.4	
3-4-II	43	101.8	
4-4-II	44	101.6	
5-4-II	45	102	
6-4-II	46	100.8	
7-4-II	47	101.4	
8-4-II	48	101	
9-4-II	49	103.2	
10-4-II	50	104.8	
11-4-II	51	102.4	
12-4-II	52	103.4	
13-4-II	53	103.8	
14-4-II	54	102.6	
15-4-II	55	101.6	
16-4-II	56	101	
17-4-II	57	101.4	
18-4-II	58	102.4	
19-4-II	59	101.8	
20-4-II	60	101.8	
21-4-II	61	102.4	
22-4-II	62	102.6	
23-4-II	63	103.4	
24-4-II	64	103.2	
25-4-II	65	103.4	
26-4-II	66	103.2	
27-4-II	67	102.8	
28-4-II	68	101.8	
29-4-II	69	102	
30-4-II	70		
1-5-II	71	102	Spirochaetosis.
2-5-II	72	103.8	
3-5-II	73	103.8	
4-5-II	74	103.8	
5-5-II	75	101.6	
6-5-II	76	100.8	
7-5-II	77	101.6	

HEIFER No. 7, "B."—*Continued.*

Date.	No. of Days.	Morning Temperature	Remarks.
8-5-II	78 38	100.2	
9-5-II	79 39	100.8	
10-5-II	80 40	101.8	
11-5-II	81 41	101.4	
12-5-II	82 42	101	
13-5-II	83 43	101.6	
14-5-II	84 44		
15-5-II	85 45	104	
16-5-II	86 46	102.8	
17-5-II	87 47	102.6	
18-5-II	88 48	101.6	
19-5-II	89 49	101.8	
20-5-II	90 50	102.4	
21-5-II	91 51		
22-5-II	92 52	103	
23-5-II	93 53	100.2	
24-5-II	94 54	102.6	
25-5-II	95 55	100.8	
26-5-II	96 56	101.4	
27-5-II	97 57	102	
28-5-II	98 58		
29-5-II	99 59	101.8	
30-5-II	100 60	103.6	
31-5-II	101 61	102.8	
1-6-II	102 62	101	
2-6-II	103 63	101	
3-6-II	104 64		
4-6-II	105 65		
5-6-II	106 66	102.6	
6-6-II	107 67	101.8	
7-6-II	108 68	102	
8-6-II	109 69	102.4	
9-6-II	110 70		
10-6-II	111 71		
11-6-II	112 72		
12-6-II	113 73		
13-6-II	114 74	101.8	
14-6-II	115 75	102.8	
15-6-II	116 76	102	
16-6-II	117 77	102.2	
17-6-II	118 78	102.4	
18-6-II	119 79		
19-6-II	120 80		Shot

SARCOSPORIDIA.

Sarcosporidia have been seen in the scrapings of the cervical muscles of a sheep, and once in the heart muscle of a Mashona cow. As both these animals were bred and born in Rhodesia, it is probable that these parasites could be found more frequently if sought for.

HORSE SICKNESS.

In the April issue of the RHODESIA AGRICULTURAL JOURNAL (1911) an article appeared on "The Transmission of Horse Sickness through the Dog by Feeding." The circumstances of the experiments therein described may be briefly summarised. In January, 1911, certain hounds of the Gwelo Hunt Club contracted a disease after feeding on a mule which had died during the process of inoculation by Theiler's method. Blood taken from two such sick hounds was brought to Salisbury and injected into a horse, which died of typical "dik-kop" ten days after the injection. Parts of this horse were eaten by a dog, which showed a marked elevation of temperature thirteen days after the meal. When the temperature was at its highest a quantity of the dog's blood was taken and inoculated into a horse. Six days after, this animal's temperature commenced to rise and day by day increased, while symptoms of "dik-kop" became well marked. This horse recovered, and was subsequently tested with Theiler's virus and proved to be immune.

Since the publication of these experiments, one or two others have been carried out which confirm the deductions drawn.

From the second horse which reacted, blood was taken during the reaction, and 3 c.c. was inoculated into a horse which died of the pulmonary form on the twelfth day after injection, thus proving the correctness of the diagnosis of horse sickness in the horse which recovered, and showing that the virulence of the strain was maintained through the following passages :

No.	Animal	Fate	Place	Infected
1	Mule	died	Gwelo	By inoculation, Theiler's method.
2	Dog	died	"	By feeding.
3	Horse	died	Salisbury	Inoculated with blood from dog.
4	Dog	recovered	"	By feeding upon meat of above horse.
5	Horse	recovered	"	Blood from dog (4).
6	Horse	recovered	"	Blood from horse (5).
7	Horse	died	"	Blood from horse (6).

It was thought desirable to conduct similar experiments with another strain of virus, and an opportunity occurred with the death of a pony which had contracted horse sickness in the Salisbury district. Pieces of muscle, heart and liver were fed to a kafir dog which had been at the Laboratory for some time previously. Its temperature, hitherto normal and very regular, showed a distinct elevation five days after the meal and remained irregular until the fourteenth day. Blood was taken, but has not yet been tested.

Temperature chart of Kafir-dog before and after eating meat of above pony.

Date.	Morning Temperature.	No. of Days	Remarks.
20-6-II	101.8		
21-6-II	101.2		
22-6-II	102		
23-6-II	101.6		
24-6-II	101.2		
25-6-II	102.2		
26-6-II	101		
27-6-II	102		
28-6-II	99.6		
29-6-II	101.6		

Temperature chart of Kafir-dog.—*Continued*

Date.	Morning Temperature.	No. of Days.	Remarks.
30-6-II	101.6		Fed on meat.
1-7-II	101.4		
2-7-II	101	1	
3-7-II	101.4	2	
4-7-II	101.6	3	
5-7-II	101.6	4	
6-7-II	101.8	5	
7-7-II	104	6	
8-7-II	103.4	7	
9-7-II	102	8	
10-7-II	100.2	9	
11-7-II	101.4	10	
12-7-II	101.6	11	
13-7-II	102.8	12	
14-7-II	102.4	13	
15-7-II	101.2	14	
16-7-II	101.8	15	
17-7-II	101.4	16	
18-7-II	101.4	17	
19-7-II	101.8	18	
20-7-II	101.8	19	
21-7-II	101.4	20	
22-7-II	101.4	21	
23-7-II	101.4	22	
24-7-II	101	23	
25-7-II	101.4	24	

It has been shown by Theiler that goats are susceptible to horse sickness, and that the virus taken from them when inoculated into a horse can produce a fatal attack. An opportunity occurred to test whether these animals could constitute a reservoir of virus from whence the infection of equines might commence. A mule which died at a certain stable in Salisbury, was the first case of horse sickness reported during the present season. The animal had been regularly stabled, and had not left the stable before or after dark. Its work was to draw a meat-cart, between the slaughter poles and town, the journeys being made during business hours, 8 a.m. till 6 p.m. It was said never to have been out-spanned at the poles, and the source of infection could not be determined.

The stables were situated in a yard where 18 goats were kraaled at night. From each of these animals 10 c.c. of blood was taken from the jugular vein, and was citrated. Of a mixture of blood so collected 100 c.c. was injected under the skin of a filly, which, however, remained healthy, its temperature not deviating from normal. This filly died on the 60th day after this injection, as the result of inoculation with another virus, which affords proof of its susceptibility to horse sickness.

(To be continued.)

New Zealand.

During 1911 butter to the value of £1,559,345 was exported from New Zealand, as against £1,823,147 in the previous year. The exports in the case of the undermentioned articles were as follows:—Cheese (1911) £1,184,082, (1910) £1,200,219; frozen beef (1911) £296,112, (1910) £596,238; frozen mutton (1911) £1,155,390, (1910) £1,248,905; frozen lamb (1911) £1,934,663, (1910) £1,876,610; wheat (1911) £219,182, (1910) £216,665; flax (1911) £314,835, (1910) £448,388; Kauri gum (1911) £395,707, (1910) £464,044; hides (1911) £165,757, (1910) £230,269; skins (1911) £716,097, (1910) £863,733; tallow and oleo-margarine (1911) £608,760, (1910) £755,319; timber (1911) £440,270, (1910) £407,984; wool (1911) £6,548,509, (1910) £8,270,903; gold (1911) £1,816,989, (1910) £1,896,318.

Fruit growers generally have recognised for some time past that grass growing around the stems of fruit trees is injurious; but the actual way in which damage was done has been more or less a mystery. Recent experiments at Woburn Experimental Fruit Farm tend to prove almost conclusively that it is caused by a toxic substance formed during the growth of grass. This toxic substance is, however, readily oxidised into some substance which favours plant growth, and this explains why soil taken from grassland is more favourable than ordinary soil to plant-growth after it has been stored for a short time so as to kill the grass. Experiments of various kinds have been conducted with a view to ascertaining whether the grass caused a physical alteration in the soil that would be likely to cause injury; but wherever any change was noted it was favourable to plant-growth rather than otherwise. What this toxic substance is does not appear to be known; but, happily, it is capable of being quickly and easily transformed into some other substance; also apparently unknown, which is favourable to plant-growth.

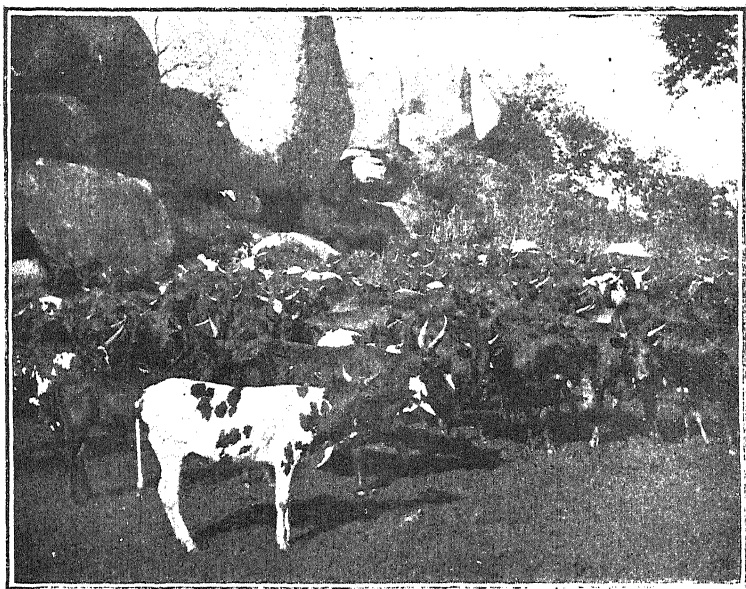
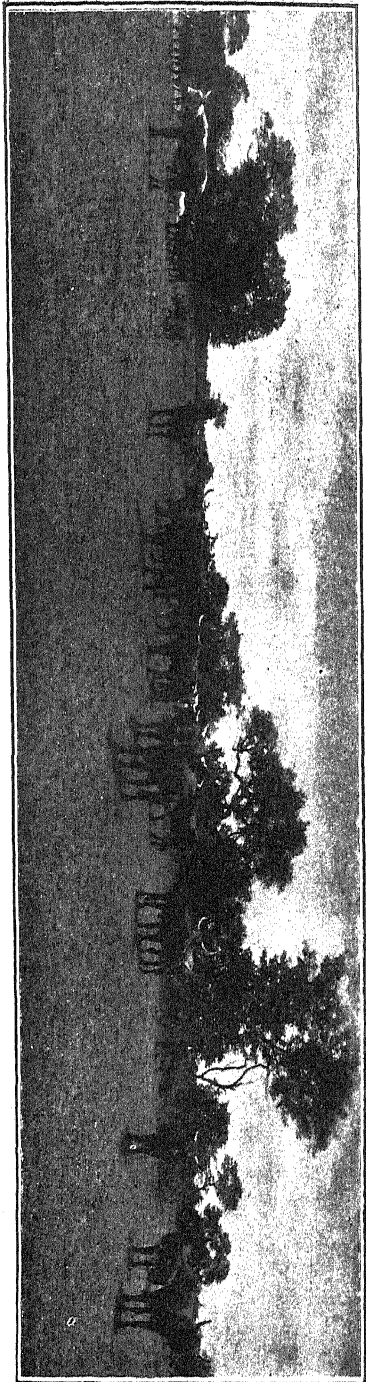


PHOTO BY ERIC. A. NOBBS.

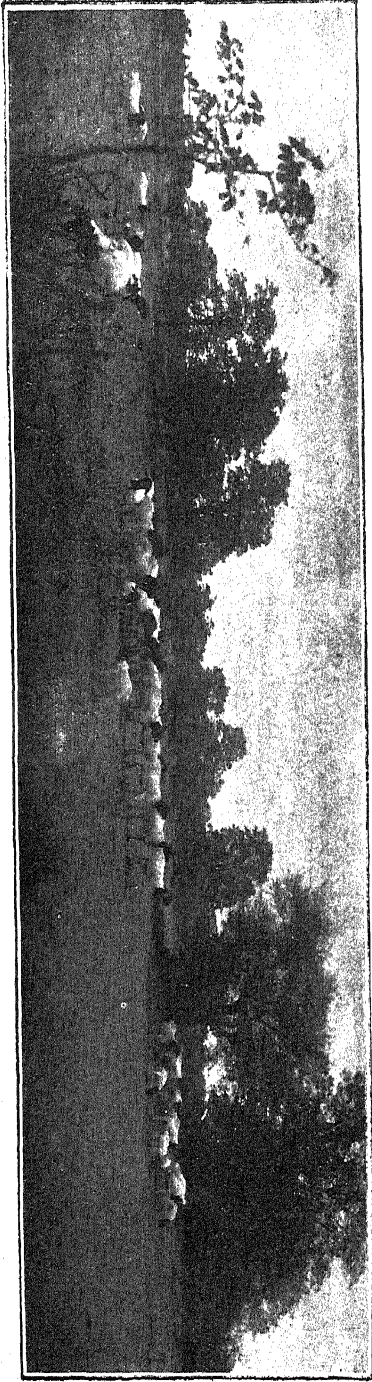
Liebig's Extract of Meat Co., Ltd., Troop of Cattle in night enclosure.



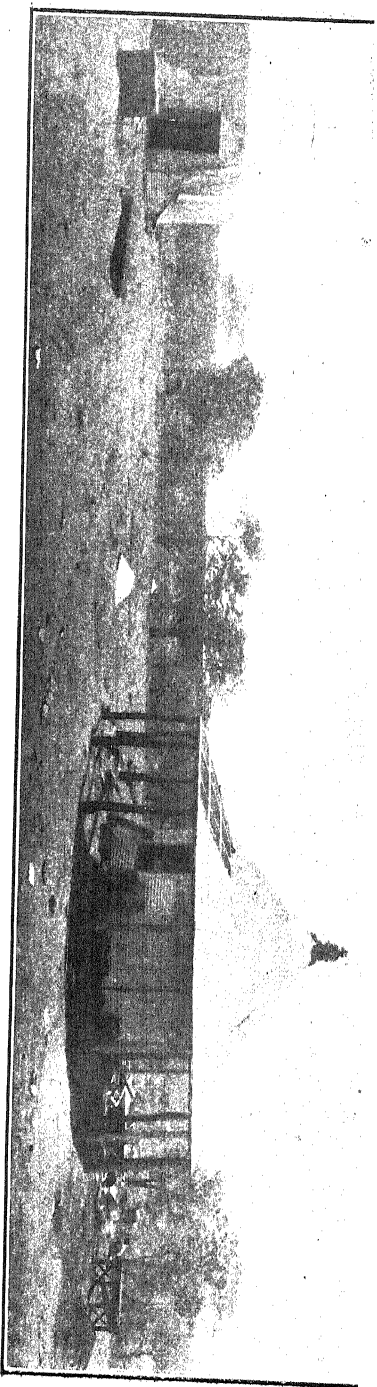
Troop of Native Cattle *en route*, crossing a river.
Liebig's Extract of Meat Co., Ltd.,



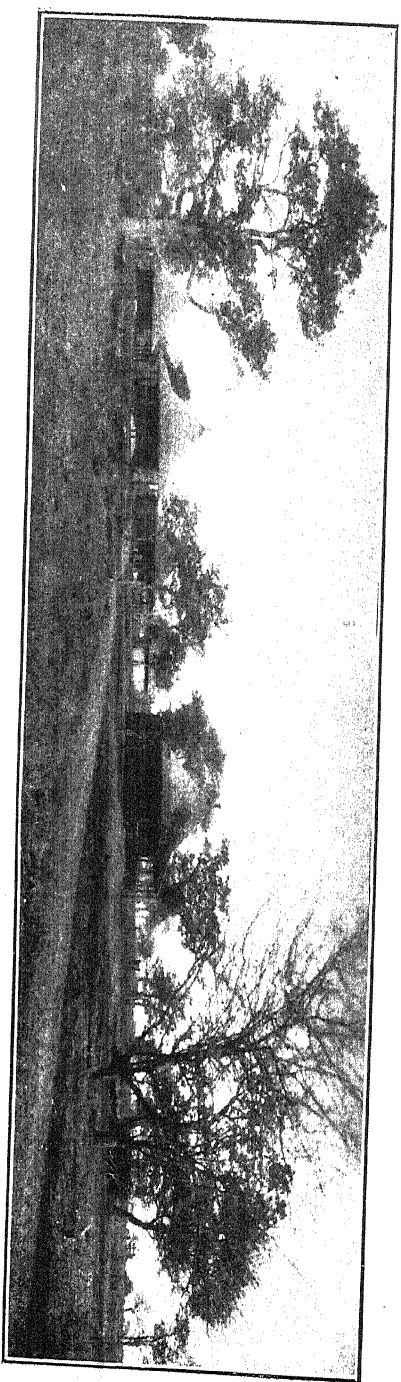
Liebig's Extract of Meat Co., Ltd., Native Cattle.



Liebig's Extract of Meat Co., Ltd., Persian Sheep.



Liebig's Extract of Meat Co., Ltd., Buildings at Section II, Makalali.



Liebig's Extract of Meat Co., Ltd. A view in Makalali.

Liebig's Extract of Meat Company's Rhodesia Enterprise.

By H. H. DE LAESSOE.

In January, 1911, the Liebig's Extract of Meat Co. acquired one and a quarter million acres in Southern Rhodesia, and immediately set about developing their holding, with a view to establishing an extensive ranching concern, capable of lending practical support to a potential factory, should it be found that cattle-breeding and ranching in the country generally are likely to develop on sufficiently broad and definite lines, to warrant, at some future date, the erection of a factory for beef products.

The bulk of the Lemco holdings are situated in Southern Matabeleland, Belingwe and Tuli districts, where, as is well known, the best natural grazing, and the richest soils are found. The Company's headquarters are established centrally in Tuli district, at Mazunga, and extensive premises for offices and staff-quarters have been erected there. A good road and telephone line have been constructed to connect West Nicholson station with Mazunga, where already quite a settlement has been formed. At varying distances "Sectional" camps have been established, from which the ranching management is carried on. Each of these sections is provided with homesteads and buildings, and connected with head-quarters by road and telephone. Already between 4,000 and 5,000 head of cattle have been placed on the ground, and contracts for further supplies have been given out. The cattle are prospering, and even those drawn from distant localities are acclimatizing readily. The policy adopted in preliminary stocking, has been that of acquiring hardy, rather than

highly bred stock. Where fresh ground has to be broken, and new country pioneered, more delicate animals must needs be at a disadvantage, and not until the land has been to some extent civilised, from the cattle point of view, can one expect animals imported from abroad, and reared under much more advanced conditions, to thrive as they should. This more especially applies to ranching, as distinguished from farming, inasmuch as the personal attention which the farmer can at all times bestow on any individual animal, is not possible for the ranch manager who has to handle large numbers. The cattle are for the present managed on the herding system, and paddocked or kraaled at night. More intimate and detailed knowledge of the large area operated over will reveal the lines on which fencing can most advantageously be done, and paddocks laid out, thus providing the ideal conditions under which cattle can run at large continuously. Experimentally an area has been ring-fenced, in which 500 head of cattle are let run night and day; the idea being thus to ascertain early the developments likely to take place both as regards the grazing and the growth and habits of the cattle. The Company's herds are free from disease of any kind, and every care is taken to keep them so. Four dipping tanks, constructed on the most approved lines, are already in constant use, and all stock, including cattle owned by natives, are dipped, once a fortnight in winter and once a week in summer. All cattle introduced from other districts are, on arrival, quarantined for several months before being allowed in contact with the remainder of the stock. To eliminate all risk from transport animals, a motor transport and passenger service with West Nicholson is provided.

As soon as conditions permit, it is proposed to grade up the local cattle, by the importation from overseas, of some of the best blood of the well-known beef breeds. To this end an experiment is this year being made with the importation of a limited number of young bulls and heifers of the Aberdeen Angus and Sussex breeds. These animals are at present undergoing the redwater inoculation process in England. No effort is spared to render the conditions for stock as ideal as possible. Numerous wells and boreholes are being put down, in order that pure and unlimited supplies

of water may be available at every point ; and experiments on a considerable scale are being made with valuable grasses and fodder plants. The thoroughness with which such matters are being gone into may be gauged from the fact, for instance, that a detailed topographical survey, showing all natural features, is being undertaken, in conjunction with the collection of a systematic series of grass specimens and soil samples for purposes of analysis.

A limited number of non-woolled sheep (both Persian and Cape varieties) is being run with success. Breeding of good class donkeys is also being undertaken, Catalanian Jacks being imported from Spain. The natives resident on the properties live rent free, thus ensuring an ample labour supply. Regulations are being enforced checking indiscriminate moving of cattle and making dipping compulsory. Arrangements are also made to eliminate the inferior grade native-bred bulls from the ground.

The healthiness of the district opened up has proved unexceptionable, and even attacks of malaria amongst Europeans have been few and far between. It is hoped that the active and progressive development policy adopted by the Company may assist in establishing confidence in the resources of stock-raising in Rhodesia, and thus assist in developing the latent possibilities of a meat industry in the country.

Tobacco.

THE NEW CROP.

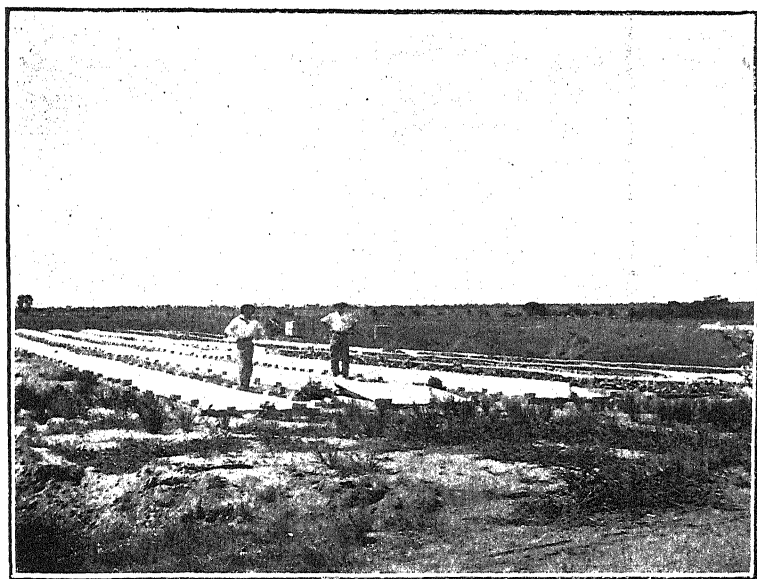
HINTS FOR GROWERS.

The new tobacco crop is now coming in freely, and the warehouse is once again assuming a business-like aspect with the process of drying and grading the leaf in full swing. There is a larger acreage of tobacco this year, and from what can be gathered, the crop, notwithstanding the unprecedented drought in the early part of the year, will probably be larger than that of last year. There is a very fair percentage of good bright leaf in the warehouse, but some of the tobacco received has been packed damp; some of it so damp that, upon the bale being opened, the inside leaves are found to be mouldy. Tobacco packed too damp loses colour very rapidly, and growers must allow for the fact that when the rush takes place their tobacco may not be dealt with for perhaps a month after it is received at the warehouse. By this time the leaf has darkened very considerably, and the value deteriorated. The leaf, of course, must not be packed too dry, for it then soon becomes brittle, and a lot goes to scrap. What is required is a happy medium between the two. Some of the leaf sent in, has been picked too green, and this is a point growers should also pay attention to.

The leaf being harvested the grower should turn his attention to preparing his land for the next crop. The stubble, if allowed to remain in the land, weakens the soil and harbours injurious insects. It is, therefore, of the utmost importance that the stalks should be taken out and burnt as soon after the crop is reaped as possible. The proper



Virginia Leaf grown without Fertiliser, at Mr. A. Bradshaw's Farm,
Una Farm, Marandellas, on rich sandy soil.



Seed Beds. Mr. S. L. Nalty's Farm, Chudleigh, Marandellas.

preparation of the land for the tobacco crop is an item which is frequently treated with too little care. It is, in reality, the most important cultivation the crop ever gets. Thorough preparation until the land is soft and mellow is the rule for all crops, but especially is this true of tobacco. A good crop of tobacco is very rarely harvested from poorly prepared land. The land should be ploughed just before the planting season, and the breaking of the ground should be thorough and at least six inches deep. Double-cutting with a disk harrow just before the time of laying off the rows, pulverises the land more thoroughly than re-ploughing and is, therefore, preferable. It has been found profitable to lay off the tobacco rows only a few days before the transplanting season, for the land is likely to become foul with weeds and grass, unless it is constantly cultivated. It is possible the land may be full of insects, and there is no better way of cleaning it than to keep flocks of turkeys and fowls where they can follow the implements, and pick up the caterpillars and grasshoppers. It is cheaper to fight cutworms and grasshoppers before planting time, than afterwards. In preparing new ground for tobacco it is preferable to turn over the land while the grass is green. In good time before planting time work the land up into garden tilth, and keep it so by harrowing as soon after every rain as the condition of the soil will permit. Many crops are checked in their growth by the fact that the soils do not contain sufficient moisture, which would not be the case if the rainfall had been conserved by careful tillage. Do not be deceived by the thought that surface cultivation causes a loss of moisture during dry weather; it has the opposite effect.

To be good land for bright or Turkish tobacco the soil must contain a large percentage of sand. The sand-stone area of Matabeleland, includes some excellent soils for Turkish, and where the rainfall is sufficient, for Virginia tobacco as well. Many of the granitic soils will grow good tobacco, but require the application of fertilisers. It may be taken as a criterion that not less than 200lbs. of fertiliser per acre should be used on light sandy soils. Among our best soils for both types are the reddish sandy loams created by the blending of granitic and schistose soils. These often have both the texture and fertility required. Vlei soils, heavy

black or red soils grow a leaf too coarse and heavy for market requirements, and soils containing "brack" or alkali should always be avoided. The fertility of the soils can often be fairly determined by the growth of timber or grass. All tobacco soils should have good natural drainage, and it is of particular moment to note whether the granitic soils are underlaid with an impervious sub-soil. New lands, or those freshly broken up from grass, produce the brightest leaf, but their use is conditional on their being worked up to a perfect tilth before planting time.

More attention is now being paid by growers to irrigating their crops, and one farmer has on order an irrigation plant to cost £700, while others are contemplating similar action. It has been observed that weather conditions being equal, tobacco planted out before the New Year invariably does better than that put in after, and it is here that irrigation will be found beneficial. With irrigation, growers would be able to plant out as early as November, and there would be time for the crop to grow and ripen before the advent of the heavy rains, for tobacco which has been ripened during heavy rains will be washed and deficient in aroma. Appearing with this article will be seen a photo of Mr. A. Bradshaw's tobacco at Una Farm, Marandellas. This crop was planted out on November 10th under irrigation and the plants protected with paper covers, until they had attained a substantial growth. No fertiliser was used and the tobacco prospered, and a good crop was harvested. The irrigation of tobacco is certainly worthy of wide attention.

The Prospects of Tobacco Culture in Rhodesia.

By A. G. STEWART RICHARDSON.

In spite of the prolonged and destructive drought that growers have had to contend with in the season 1911-12, the tobacco industry of Rhodesia was never in a stronger position than at present. Here and there crops have entirely failed. Speaking broadly, the quality of the leaf harvested is below that of 1910-11; still our leaf has made a name for itself, and the local manufacturing company, by its spirited competition with other buyers, has entirely revived an industry that showed some signs of drooping not so long ago. However, the most optimistic grower cannot but recognise that the rate of progress made by the industry as a whole has been very deliberate in face of the extremely good prices given us by the buyers. I attribute much of this slowness to three principal causes:—(1) Present site of plantations (2) scarcity and cost of native labour, and (3) lack of enterprise in trying the suitability of soils other than the stereotyped granite sands—this latter applies more especially to the Turkish types of tobacco.

I append a few notes—the result of personal observation on these three points—leaving such matters as different curing methods, fertilizers, etc., to the recognised experts on the subject, these details being much the same all the world over, while outside the immediate vicinity of the railways Rhodesia unfortunately remains more or less *terra incognita* so far as its soils are concerned.

Rhodesia, as everyone knows, has so far been developed in the matter of railways, roads, etc., to suit the premier indus-

try of the country—mining. The mines being the farmers' markets, agricultural development has of course followed the railway systems, which, built to connect the principal mining districts with the towns, have naturally followed our bleak high-lying watersheds as the cheapest route, and as naturally have avoided the low-lying, sub-tropical, rich (and, incidentally, rather unhealthy) valleys lying principally to the north of the main watershed. The country thus developed, and on which practically all our principal farmers are established, while for the most part eminently suitable for cattle-raising, only grows a fraction of the crops that the undeveloped and low-lying portions of the country will eventually produce if given railway communication with the markets. Until then, however, such points as long and costly animal transport, nearly total isolation, and the undoubted prevalence of malaria, even though accompanied by double and treble crops grown with a minimum of trouble, are bound to weigh heavily with settlers, and cause land settlement to be practically confined to the watersheds, and the immediate vicinity of mines and railways.

On these watersheds granitic soils predominate, and as such soils will, with care, produce a bright leaf of high quality, tobacco is taking a prominent part in the crop routine. However, though the settler finds the climate to agree with him very well, it is doubtful if the tobacco finds itself in equally comfortable circumstances. Firstly, to produce a commercial quantity of leaf per acre—say 500 lbs. and upwards—on these high-lying granitic soils, quantities of costly fertilisers have to be used. Secondly, the rainfall though good, is not so reliable as it is further north, nor do the soils withstand drought, or absorb excessive moisture so well as those of portions of the low veld. Thirdly, the spectre of early frost constantly confronts the grower who from any reasons whatever has to plant rather late. Fourthly, natives resemble tobacco in as much as they love veld where tropical and sub-tropical conditions make the struggle for a livelihood comparatively easy, and consequently they avoid the watersheds and are found in their numbers on the low veld, and a good supply of native labour is essential to the tobacco planter.

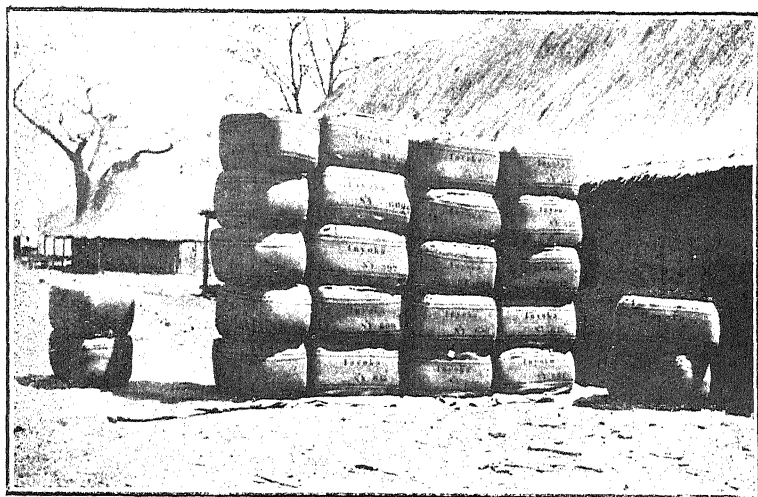


PHOTO BY ERIC. A. NOBBS.

Turkish Tobacco ready for despatch, Inyoka Concession.



Farm Buildings and Tobacco Lands, Inyoka Concession.

Down on the low veld—in the great sandstone belts that traverse the country from Wankies to the Lomagundi are valleys where tobacco can be grown under ideal conditions—means of access to the markets alone excepted. The soil for many years running will, in places, produce crops running as high as from 900lbs. to 1,500lbs. per acre, without any fertiliser whatsoever. In place of stimulating growth, the planter, in an average season, has to try to keep that growth within bounds, and in some cases to effect this he ploughs shallow and plants very late. I have seen a crop of Turkish tobacco planted in December (two months too soon) grow into a jungle in which a man on horseback would be invisible, with middle leaves bigger than the rankest Virginian.

If our mines and settlement had occurred in districts such as these, our planters would by now be growing such quantities of leaf, and at so low a cost, that exportation to the home markets would have occurred long ago, to the benefit of all concerned, while, as things are, we are struggling to supply the comparatively insignificant South African demand, protected by the high import duty. Eventually, no doubt, as settlement proceeds the low veldt will be tapped by one or more railways, and when that occurs the industry will make giant strides. Cigar fillers and wrappers will then also undoubtedly be added to our present unvarying output of cigarette and pipe leaf.

The scarcity and cost of native labour has been referred to in a previous paragraph. Of course, all parts of the low veld do not carry a big native population, still labourers are, on the whole, more easily procured and at lower wages, when the vicinity of the mines is avoided, and the distance from their home is insignificant. Boys from the Zambesi valley on their way south, pass through the sandstone belts and are often willing to stop there.

We are now enjoying a good supply of labour, caused by the failure of the native crops. But we may expect an equally unanimous exodus, when the planting season returns, and for 1913 the prospects of an organised labour supply for the farmers and planters appear exceptionally remote,

It was laid down in the early days of tobacco growing in Rhodesia that only the poorest white granitic sands were capable of producing a good smokeable leaf. Everyone admits that if you fill up these poor hungry sands with expensive fertilisers you produce a small crop of very fine, delicate, and if properly handled, bright leaf.

In Rhodesia at present nearly all the tobacco is grown under similar conditions on similar soils—consequently there is no scope for blending. You might as well take two tins of the same quality nectar tea and by mixing them expect to get a new blend. Everyone is struggling to grow the canary coloured bright leaf, and every crop contains half-a-dozen variations rung on this change.

Some of the most aromatic tobacco produced in this country was grown on a patch of stiff, grey Mopani clay (and it fetched a better price than the best bright Virginian). It was totally different in aroma and smoking qualities to some leaf produced on deep sandstone alluvial not 200 yards away, and would no doubt blend admirably with the latter. So long, of course, as the demand for bright Virginian is bigger than the supply, people will neglect other types, but the day must come when buyers want more than colour to mix with their inferior dark types of leaf. When that time arrives, Rhodesia can fill the gap—but our leaf will not all be grown in granite sand.

We used to be told that goat and sheep manure was fatal to all classes of tobacco. Now we know that for the grower of Turkish tobacco such manure is absolutely invaluable. There are probably hundreds of equally important re-discoveries to be made, and made they must be, before the industry reaches the level that most of us interested in its development hope and expect it to attain.

Notes on Tobacco Growing and Curing under Local Conditions.

By C. S. JOBLING, Devonby, Nyamandhlovu.

*(A Paper read before the Rhodesia Agricultural Union Congress,
29th April, 1912.)*

The following remarks are the outcome of seven years experience and observation as a tobacco grower.

Virginia type of tobacco only will be dealt with in this paper, having in view the production of "bright" or yellow leaf.

SOIL.—The first essential is suitable soil; this must be chosen with regard to its adaptability in two respects, viz., physical characteristics as well as chemical constituents. The soil particles must be comparatively large, thus rendering it open and porous in texture, as well as capable of rapid draining. In other words, the soil must be of a sandy nature. Generally speaking, the poorer types of sandy soil are preferable. These are usually derived either from granite or sandstone. The experiences of the writer are confined entirely to the latter class. It may be said that the poorer the soil the brighter the leaf; though it will readily be understood that a degree of soil poverty can be attained which will preclude the possibility of obtaining sufficient weight per acre to make the crop a payable one; but this much can be said for such soils, that they may be enriched by the application of artificial fertilisers. On the other hand, if heavy rich soil is used, the results will always be disappointing, and the product will only be saleable at very unremunerative prices.

SEED BEDS.—Too much stress cannot be laid upon the vital importance of giving these great attention. A good supply of healthy plants is half the battle. A continual succession of beds should be planted so that a regular supply of plants may be ready for planting out from about November 1st up till January 10th. All beds should be insect-proof. A good bed is made by building a single

brick wall all round, three bricks high. Lime mortar should be used, not dagga, as the latter washes out during heavy rains. A convenient size is 100 feet long by 5 feet wide. One and a half tablespoons of good seed will be quite sufficient for a bed of this size, and under ordinary circumstances it will produce enough plants for about $2\frac{1}{2}$ acres. It is advisable, however, to provide at least double the number of plants which it is thought will be required. The beds should first of all be soaked to a depth of three or four inches and should then be burned by means of an open fire. Mealie cobs make the best fuel for the purpose, but dry tobacco stalks from the previous year are also useful, and failing either of these, trash of any kind or small brushwood may be used. The soil should now be hoed to a depth of not more than three inches, all lumps broken and the surface raked as smooth as possible. It is now ready for seeding. In planting, the quantity of seed above mentioned is thoroughly incorporated with 10lbs. of S.A.F. Co's. Fertiliser, and the whole distributed as evenly as possible over the bed. It is then watered with the ordinary watering can fitted with a fine rose. The seed is not raked in or covered in any way, the spray from the watering can being sufficient to effect all the covering necessary. The bed is then immediately covered to the depth of about an inch with cleaned thatch grass, and the cloth covering stretched over the top; all subsequent watering being done through the cloth. From about the fifth day a careful watch is kept for germination. As soon as this has taken place, and the tiny rootlet is seen bending downwards, the grass is removed, and an extra thickness of cloth put over the bed to keep off the sun's rays. At this stage the surface of the bed must be kept continually moist, and within two or three days the plants will be sufficiently developed to show up green over the whole bed. One cloth is now removed, the other remains, and is never taken off, except for weeding purposes, until the plants grow right up against it, which will be in about six or seven weeks from planting. It must then be removed in order that the plants may harden, and get accustomed to the sun before transplanting. It is a good plan to return the cloth every evening, removing each morning; this prevents moths gaining access to the beds at nights, and there depositing their eggs.

TRANSPLANTING AND TREATMENT IN THE FIELD.—

Contrary to the opinions expressed in most American works on the subject, I am a firm believer in a large plant; it can hardly be too big, in reason, so long as it is healthy, and has not been checked in the bed. Colour is the best guide in this respect. A pale yellow, sickly looking plant rarely makes satisfactory growth in the field. The seed bed is well soaked before beginning to draw plants, so that they come out easily. The tap root of each is snipped off when taken from the bed; they are then packed in boxes, and carried to the field. The usual planting distance is 3ft. by 3ft. The rows are marked off by a home-made marker, which is drawn by a horse, and marks four rows at a time. The field is marked both ways. This saves a lot of time in planting, as the exact spot for each plant is clearly shown wherever one mark intersects another; and further, it permits of cultivation both ways subsequently. Planting pegs with iron points are used, and there is always difficulty in teaching new boys to tighten the plants properly. The tendency is to tighten them at the surface, and leave the root hanging in a hole. Plants treated like this will stand still for weeks, and unless the weather is favourable, will die. The soil must be pressed firmly against the roots. Unless the weather is very dull and showery, the soil is heaped round the plant when planting to protect the heart, to be removed about the third or fourth day, when the roots have struck.

As soon as the plants are well established, cultivation should begin, and it cannot be repeated too often. A horse hoe may be used while the plants are still small, but if a supply of labour is available, I prefer hand hoeing. This must be done at intervals, both for the purpose of destroying weeds and conserving moisture, until the blossoms appear. Topping then becomes necessary. It is difficult to describe on paper just how this should be done; any number of leaves from eight to sixteen may be left, dependent upon the size and robustness or otherwise of the individual plant. At the same time the tobacco should be primed. By this is meant the removal of the bottom three or four leaves which are usually damaged or misshapen.

Suckering will next call for attention; this will be necessary about a week or ten days after topping. By this is meant the breaking off of the young shoots which spring from each leaf

axil, in an attempt to form seed heads in place of the main stem which has been removed by topping. They may be much more easily removed while young and brittle than if allowed to become older and more fibrous. Suckering may be done once, twice, or a number of times, dependent upon the nature of the leaf. The object is to cause the sap, which would naturally have gone to form seed, to flow into the leaves and give them more body. If the leaf has a tendency towards heaviness, it will be well to sucker only once, afterwards permitting the suckers to grow up and blossom. Indeed, in some cases, it may be wise not to sucker at all.

HARVESTING AND CURING.—The bottom leaves of the plant will be the first to mature. Indications of ripeness vary in the different classes of leaf. In the case of really light leaf, harvesting should commence when the colour becomes a light yellowish green: this type of leaf will never crack when bent double between finger and thumb. The heavier leaf will become spotted and break clearly when pinched up in the fingers. It will be found advisable not to commence reaping before 9 a.m., as in the early morning light it is difficult to distinguish the ripe leaves from those which are green. The leaf is loaded on wagons and carted to the barn. It is then tied on sticks (in the shade) in bunches of three, and hung at once in the barn. The barns used are 16ft. x 16ft. and 6 tiers high. A barn of these dimensions takes about 1,000 sticks, which will yield on an average 1,000 lbs. of cured leaf. It is impossible to lay down a definite set of instructions for curing; practically no two barns are treated exactly alike; so much depends upon the varying degrees of ripeness, lightness or heaviness of leaf, and atmospheric conditions. Successful curing can only be learnt by experience, and close attention to detail. The following is roughly the treatment applicable in the case of a barn of light, ripe leaf.

Immediately it is filled the door and ventilators are closed, fire lighted, and the temperature raised to 90 degrees at which point it remains for three hours. It is then raised as follows:—

	to 95 degrees for 3 hours, then
100	6 " "
105	3 " "
110	9—12 hours,

or until the leaf is yellow enough to commence drying off. The temperature is then quickly raised to 120 degrees, when door and ventilators are opened wide until the thermometer drops to 110 degrees. This is repeated about six times, after which the barn is held at 120 degrees for about two hours. It is then raised quickly to 130 degrees, and allowed by admitting cold air, to drop to 120 degrees. This is repeated three or four times. Then it is held at 130 degrees for two to three hours, with ventilators slightly open. Following this it is raised 5 degrees every two hours until 150 degrees is reached, at which point it remains for about six hours. The critical stage is now passed, and it only remains to dry out the leaf and kill the rib. The temperature may be moved up to 160 degrees and held there until the last twelve hours, during which it is kept at 175 degrees. The fire is then drawn, door and ventilators opened wide, and 24 hours allowed for the barn to cool off. It takes five days to cure a barn.

The main points to be observed in curing are, first, to get the tobacco yellow. Moisture is necessary for this; none should be permitted to escape until the tobacco is yellow. Do not wait until the entire leaf is yellow, or sponging will inevitably follow. If the lower half of the majority of leaves is yellow, it is time to start drying. Go as fast as you can without splotching, but it is always safer to go slowly even at the expense of a little sponging, rather than too fast and cook the entire barn.

The leaf is now cured, but so dry and brittle that it will break into powder if grasped. It must be ordered or softened so that it can be handled without breaking. This is done by the use of steam, generated in a 400-gallon iron tank and conducted to the barn in a pipe. This pipe goes right across the barn a little above the flues, and is perforated with small holes every three inches, on each side, thus distributing the steam evenly. Care must be exercised in ordering not to get the leaf too damp, or it will run dark in colour or even go mouldy. When the lower halves of the leaves, which first come in contact with the steam, are soft enough to grasp firmly in the hand without breaking, the tobacco may be taken out of the barn and bulked on the sticks in a close room, or preferably an underground chamber. During the night the moisture in the tips of the leaves will

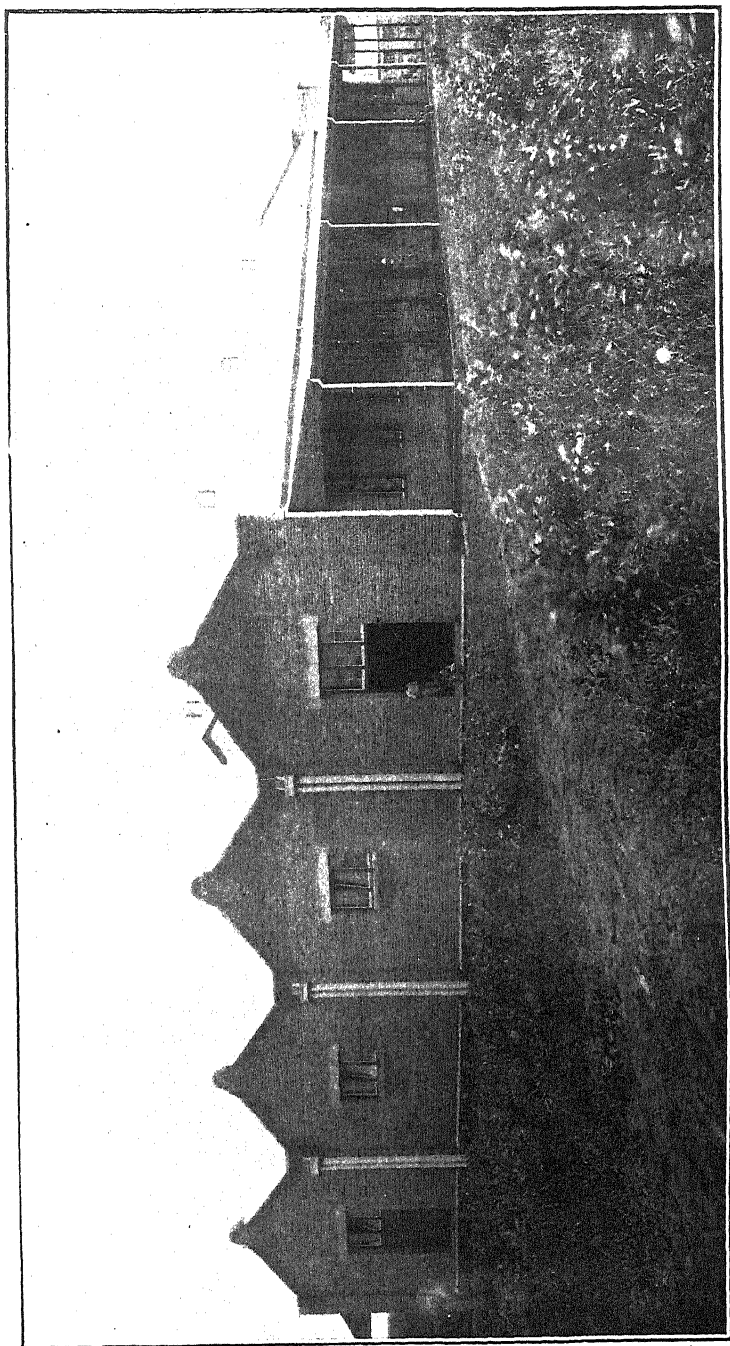
spread through the drier parts; the whole bulk should be ready to take off the sticks the following morning and go straight to the baling press.

PESTS.—Leaf caterpillars and cutworms sometimes appear in the seed beds. These can practically be wiped out in one night by spraying with Paris Green. The plants have been noticed each year to die off in the beds in circular patches from 6 to 18 inches in diameter. I can offer no explanation for this; but an application of fertiliser has a stimulating effect which appears to check it.

Handpicking has been found the only effective way of dealing with cutworms in the field, but only small patches have been affected. By far the most destructive pest is wireworm, which eats off the plants after they are put out in the field. No effective method has been found for dealing with this pest. Poisoning cannot be carried out as it works beneath the surface. The experiment was tried of treating 10 acres with Apterite, at the rate of 200lbs. per acre, broadcasted and ploughed in. This treatment had apparently no effect whatever. Great damage was being done by a worm which locates itself in the stem of the plant, causing a characteristic circular swelling of the stem itself. The plant stands still and never makes any progress; only on rare occasions does it outgrow the effects of harbouring this pernicious invader.

In conclusion, the following observations may be made:—

New land produces the brightest leaf. It is not advisable to grow tobacco more than three consecutive seasons on the same land, and preferably only two. The leaf gets darker each year. This is said of land which has been fertilised each season. It pays to use fertiliser, which assists the plants to make a quick start, as well as having a good effect on both quantity and quality of the crop. Two hundred pounds per acre of S.A.F. Co. is a satisfactory application: it may be broadcasted or harrowed in just before planting. Do not plant tobacco unless you are prepared to give it personal attention. It is not a crop which can be left to take care of itself. It is probably not wise to look too far into the future; but it may be said with some conviction, that tobacco is to-day, and probably will be for some years to come, one of the most remunerative of our Rhodesian farm crops.



Tobacco Company of Rhodesia and South Africa, Ltd., Tobacco Warehouse, Salisbury.

Notes on the Health and Treatment of Imported Bulls.

By J. M. SINCLAIR, M.R.C.V.S., Chief Veterinary Surgeon.

The December issue of this Journal contained a short history of the importation and distribution of pedigree stock imported from Great Britain, including a short description of the process of inoculation at Letombo Camp, in order to protect them against red-water and gall-sickness when exposed to veld infection.

Including some animals imported privately, 67 head were treated, of which three succumbed as the result of the inoculation, and one from infection naturally contracted on the veld. Since distribution several have died from gall-sickness and other causes.

During the months of January and February last the animals imported by Government were inspected by officers of the Veterinary Department, in order to observe the methods of treatment and usage adopted, and the progress made under local conditions.

On the whole, the reports received were very favourable, the animals being judiciously treated and rapidly adapting themselves to their new surroundings and food. In certain cases, however, the methods of feeding and general treatment were unsuited to animals unaccustomed to forage for themselves, or to fight their way with other bulls in order to fulfil the object for which they were obtained.

The following remarks are largely based on the reports furnished by the late Mr. John Cameron, Cattle Inspector, Lomagundi District :—

Unfortunately suitable food stuffs are very limited in this country, especially during the winter season. The best of all cattle foods, linseed cake, is not manufactured locally, and the imported article is prohibitive in price. Raw Linseed

can be given in small quantities, especially if mixed with a quantity, say 1lb. of crushed beans, daily. This forms an excellent food where green grass and other soft foods are unobtainable. Green forage, pumpkins and melons, together with a liberal allowance of oat manna and ordinary hay, have been largely used, and the animals, so fed, appear to have done well. To this was added, in some cases, a small ration of mealie meal, 2lbs. to 4lbs. per day. Great care, however, has to be exercised in giving this article. Some animals it does not suit, causing dietetic derangements, indigestion, purging, etc., and it is believed to be partly responsible for the foot troubles which several of the animals have had. One thing must be avoided, viz., whole mealies.

Good housing is necessary to protect the animal from the heat and rain of summer and the cold and frosts of winter. At the same time, close or warm housing must be condemned. A large shed with a grass roof rather than iron is desirable; the sides may be of iron, grass, or the ordinary wattle and daub. The free circulation of fresh air is absolutely necessary.

The lack of proper exercise together with too much heating foods, such as mealies, has to a large extent been responsible for the number of cases of footsoreness which have occurred. Regular exercise together with regular and judicious feeding are just as necessary for a stud bull as for any other animal, and more especially in this country, where well bred animals are scarce and will consequently be kept at stud for many years longer than in other countries more plentifully supplied. Of course, if bulls are allowed to run with the herd they will have more exercise than is necessary or good for them. Where constantly stabled they should be made to walk for at least an hour every day. The practice of allowing them to run in a small paddock with the selected cows for an hour morning or evening or both has much to commend it.

In many cases there was a lack of any system for utilizing the services of the bulls to the best advantage. Greater attention should be given to the selection of a good type of cow which should be carefully protected from the attentions of other bulls. The selected cows should be placed with the bull for a limited period only, either in the early

morning or in the evening when the strength of the sun and general heat are moderate. If the energies of the animals are conserved in this or other similar manner a larger crop of strong and healthy calves may be expected.

The practice of allowing the bull, especially during his first year in the new country and climate, to run all day with the herd must be condemned. The energy expended in chasing round in a hot sun, when he should be feeding or resting, must have a deleterious effect on the bull himself and in his progeny. An excellent plan is to have a small paddock, within which is the shed or stall, placed, if possible, where a large amount of shade is available at all hours of the day, the selected cows to be placed therein morning or evening, or all night if desired; during the day the bull could be allowed free, and thus obtain sufficient exercise at his own time and pleasure. Some animals will, of course, insist on going with the herd, but this might be avoided by allowing a few quiet cows to remain with him.

In conclusion, it may be mentioned that importations from England this year are likely to show a great increase, for, in addition to several private consignments and 51 head for the Rhodesdale Settlement Farm, the Department of Agriculture is getting out 72 head for distribution to farmers.

Some Notes on Charcoal Burning.

BY ERIC A. NOBBS, PH.D., B.SC.

Charcoal is the main product of the dry distillation of wood, the secondary products being tar, water, wood, alcohol, acetic acid and certain gases. Charcoal is the result of incomplete combustion, in the absence of a free supply of air, decomposition taking place at a temperature of from 570 degrees to 660 degrees F., and resulting in the formation of the above named products and of charcoal, which consists of carbon, together with the inorganic constituents of the wood, the ash.

As a commercial commodity, charcoal realises in our towns, about 2/- per bag of 70lbs. to 80lbs., whilst the mines require a considerable amount for smelting purposes. Where farmers are clearing land, or contractors cutting timber for the mines, the preparation of charcoal is always deserving of consideration, particularly as it disposes of the wood not of suitable size for fuel or mining purposes and which is therefore usually left to cumber the ground and to aggravate the damage by the next veld fire that comes along. Charcoal is only 25 per cent. of the weight of the same volume of wood, and it is, therefore, readily portable, and, in view of its far greater heating capabilities, is economical, although if sent by rail the rates for charcoal are 2d. per ton per mile, as against 9/10ths of a penny for coal and 1d. for coke. In Europe charcoal burning is almost a fine art, but here rough and ready methods suffice, a brief account of which may be helpful to those who have opportunities of making and disposing of charcoal to advantage. The native method in use, no doubt, long ago in connection with the ancient smelting industry, of which traces are still plentiful, is, as with most native ways, primitive and wasteful, but simple. A pit, three or four feet deep by about six feet in diameter is made in which a fire is lighted and the wood to be



Charcoal Burning, Hollin's Block, Matabeleland.

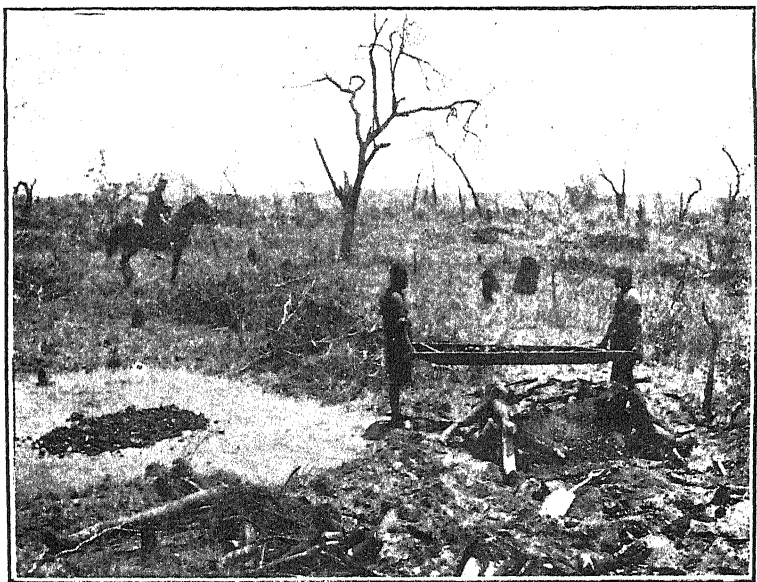


Charcoal Burning, Hollin's Block. Stacking the Timber.





Charcoal Burning, Hollin's Block. Preparing the stack.



Charcoal Burning, Hollin's Block. Sifting process.

made into charcoal placed inside. After the wood has been ignited into burning embers, earth is piled on the wood to a thickness of about nine inches and beaten down smooth, so as to exclude air. The fire is allowed to smoulder for a few days, when the earth is removed and water thrown on the charcoal. This is then sifted and made up in sacks of about 70lbs. weight. The charcoal so obtained is of inferior quality, sooty and soft.

Some time ago the writer had the opportunity of witnessing somewhat better methods in operation on the Hollins Block, Matabeleland, where at the time a supply of over 20,000 bags of charcoal was being sent to the Bushtick Mine. From this source the following notes and the accompanying illustrations are derived:—

All our soft woods are suitable for conversion into charcoal; the best is Mimosa, the Sweet Thorn, then Syringa, I'gusi and Sugar Bush, also M'tonda, M'sasa, M'wala and Waterboom. Mopani makes good charcoal but it breaks up into such small pieces that it is only suited for smithy work. None of the hard woods such as Hartekol, Yellow Wood, Knobby Thorn, nor any of the Acacias, except the Sweet Thorn, are suitable for charcoal. The chief use of charcoal here is as fuel for suction gas plants, but it is also used for forges and other metallurgical purposes on account of the intense heat it gives off in burning.

Charcoal of good quality should be close textured, completely burnt through, lustrous, black, quite clean to handle, not leaving any soot on the fingers, and breaking with a vitreous fracture and transversely with ease. It should show the texture of the original wood distinctly, and should be heavy and give out a clear metallic sound when struck. Wood for charcoal may be cut all the year round and should lie for a month to dry before being further treated; it can lie for six months without taking harm. Dead wood must on no account be used. Any wood from two to ten inches in diameter can be used for making into charcoal, but as far as may be the billets in one kiln should all be about the same thickness, although to fill up crevices and make the heap of equal density, so as to ensure even burning, it is customary to pack any spaces with small wood

and larger billets may, if necessary, be placed round the centre where the heat is greatest. The bark is left on. The trees after being felled are chopped into billets five feet long and stacks are built conveniently round the spot where the kiln is to be constructed. Stacks may be made in cords, but unless some special object is to be gained thereby, such as payment by piece labour, this course is not necessary. A convenient size of stacks for billets five feet long is about five feet six inches high by ten to eleven feet long. Such a stack should take two boys one day to cut and build. The site of the kiln should be in any convenient spot sheltered from strong winds. The size of the kiln is immaterial, and may contain anything from two to twenty cords, but a common shape is circular and about eleven feet in diameter, with material cut as above described.

No preliminary preparation of the site is necessary, but stones or stumps should be removed, or avoided. A stake or a stump of a felled tree serves as a centre. Round this a little brushwood or twigs are piled, with which the fire is to be started. Flues are made on the ground by placing two spars about eight inches in diameter, or more, near together, and parallel, bridging across the top with short pieces of thin wood, thus forming a kindling flue perhaps eight by twelve inches square. These flues are six feet or more in length, and radiate out from the central point. They are set in the line of the prevailing wind, two or four, according to the size of the kiln. There is no vertical flue or chimney.

Round the central brushwood and over these flues a few billets are piled, standing upright, but all leaning to the centre. Another ring of pieces about three feet long is built round and then the five foot lengths all leaning inwards, the interstices being packed with smaller wood. This construction is carried on until the horizontal flue spars are nearly covered, leaving about twelve inches projecting. Then a second layer of wood is built above the first, drawing to a point at the centre, the whole being built as close and compact as possible, and as steep as is compatible with the covering material used. Round the outside of the pile of wood a number of short lengths of wood, eighteen inches long and four inches thick are laid radially, one every foot and a half; on these are laid brushwood reaching through the

outer coverings. By this arrangement air is allowed in all round the bottom of the kiln, while the draught is furnished through the flues.

The stack of wood is now thatched with a layer of three inches of grass, green or dry, according to the season of the year. Over this grass, earth or sand is piled to a thickness of nine inches, or in the rainy season twelve inches, and patted down smooth. The slope of the kiln is fixed by the angle of repose of this sand, and is always to be made as steep as possible, for the reason that it is then less liable to fall in, than if more flat.

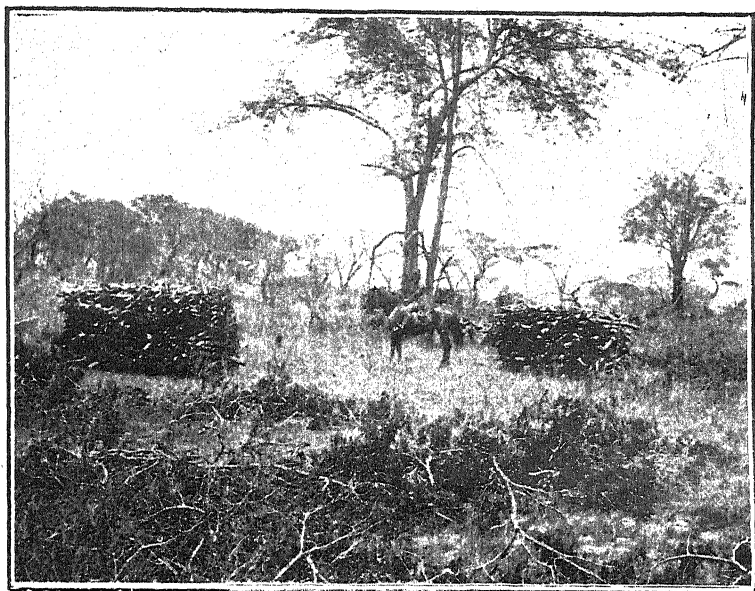
The kiln is now ready and is set on fire by introducing a torch on the end of a long pole through one of the flues to the brushwood at the centre. A kiln of eleven or twelve feet in diameter should be set alight early in the morning, as it takes from eight to twelve hours to char, and night watching is thus avoided. Wood a month old will take longer than wood which has been drying for two months or more. While burning, the covering has to be kept continually closed though smoke oozes through all over it. If a part falls in a ball of green leaves and twigs is stuffed in at once and covered over with earth. The kiln has to burn until the heat has passed right through to the outer edges and until the thick smokes alter to a clear blue vapour. Every opening is then sealed up with earth and the kiln has to remain in this condition for five to fourteen days, or even a month, with advantage. There is great heat in the kiln for two months, and if air gets in it will at once take fire and burn to ashes and be wasted. So the kilns have to be watched and every opening at once covered in. During the first day one boy can attend to six or eight kilns and on the second and following days twenty. Ultimately a long pole is thrust into the kiln and dragged backwards and forwards, so that the heap collapses and is smothered with sand. Immediately thereafter the contents of the kiln are passed through a strong iron wire sieve of meshes of not more than three-quarters of an inch and in size about four feet by ten feet and fitted with handles. The cleaned charcoal is thrown on to a cleared bare piece of ground, where it is bagged and weighed, and is ready for removal. There are many minor differences in manipulation, but the above outlines are a general guide to the process.

A kiln contains usually one or two stacks of about 11 ft. by 5 ft. 6 ins. by 5 ft., roughly $2\frac{1}{2}$ to 5 cords, and yields from 10 and 12 up to 27 bags, on an average 16 bags of 80 lbs. weight when sewn up. A 25-ton bogie truck carries from 545 to 550 bags and an ox waggon from 50 to 80 bags. The tools necessary are picks, shovels, axes, sickles, screens and a grindstone.

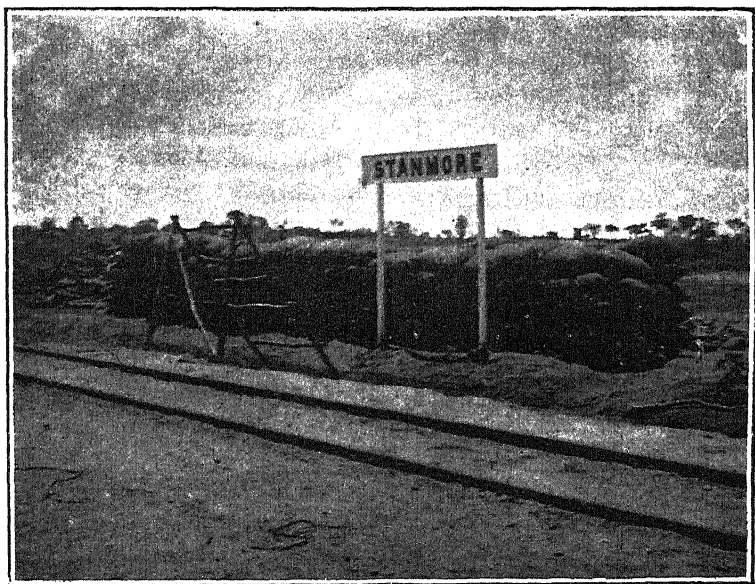
The cost of the operation may be stated roughly as follows:—

	Units of Labour per Kiln.
<i>Cutting Wood</i> .—two boys cut one stack 5 ft. by 5 ft. 6 ins. by 11 ft. per diem, two stacks ...	4
<i>Cutting Grass</i> .—one boy cuts for two kilns ...	$\frac{1}{2}$
<i>Building and covering Kiln</i> .—two boys do a kiln in one day ...	2
<i>Attendance</i> .—1st day one boy does six kilns ...	$\frac{1}{6}$
<i>Watching</i> .—20 days one boy watches 20 kilns ...	1
<i>Opening and Screening</i> .—2 boys do 2 kilns per diem ...	1
<i>Bagging and Sewing</i> .—3 boys do 80 bags per diem ...	$\frac{1}{2}$
Total labour units on one kiln ...	<u>$9\frac{1}{6}$</u>

	£	s.	d.	s.	d.
$9\frac{1}{6}$ labour units at 6d. per day	0	4	7		
Feeding and recruiting same, $4\frac{1}{2}$ d. per day ...	0	3	5		
1 kiln of 25 bags—each bag used 6 times—at 8d. per bag ...	0	2	9		
Value of wood (includes brush- wood), 2s. per cord ...	0	10	0		
Tools, sundries and supervision ...	0	2	0		
25 bags of 80 lbs.	£1	2	9	0	11, per bag
Transport and railway, say ...				0	3
					<u>1 2 per bag</u>



Charcoal Burning, Hollin's Block. Timber stacked for burning



Charcoal Burning, Hollin's Block. Bagged Charcoal, ready for despatch

Utility Poultry Keeping for Amateurs and Beginners.

By "GALLINULE."

II.—FOODS AND FEEDING.

(Continued from April Number.)

It requires no demonstration to show that the most important detail in the management of livestock is the feeding. Sensible feeding, which is only another name for scientific feeding, is but little understood, either amongst poultrymen or general farmers, and it seems to me that this unsatisfactory condition of affairs, although due in the first place to the intrinsic difficulty of the subject, is largely accentuated by the fact that much of the available information on the subject is couched in language far too technical and fenced around by a terminology, which is not easily apprehended by those who have had little or no training in practical science. Add to this the fact that, despite all the aid that biology, chemistry and physiology render us, we do not even in this twentieth century thoroughly understand all the obtruse problems which digestion and nutrition present, although there is many a man, who ought to know better, who thinks we do. The pretty word, "metabolism," is used to cloak a host of ignorances, whereby we deceive ourselves.

Since this is the case, it would seem hopeless for mere poultrymen to attempt to grasp the principles which underlie the art of feeding. Yet we may be able to gather a few facts for our guidance, and gain a useful, if not altogether, complete insight into the most important area of investigation, if we are content to leave side issues to shift for themselves and stick to the main article of the orthodox

poultryman's creed—the necessity of adhering as closely as possible to the nutritive ratio.

Hereby we understand a certain and exact proportion between the nitrogenous food elements and the non-nitrogenous or carbonaceous. Swine feeders may, and do, transgress the law of proportion with impunity; poultry-feeders may not. To them this is, or should be, the whole of the law and the prophets. The reason why this should be so is both biological and physiological, and demands for its complete comprehension a fair knowledge of both sciences; but it can be explained in a rough-and-ready way which for the time being will serve our purposes.

Nutrition is not, as far too many people suppose, a term synonymous or interchangeable with digestion. Much food is easily digested, which is far from nutritious, such as arrowroot and rice. Many foods such as bran are highly nutritious, but can only be digested by ruminants and birds; while many so-called foods are neither digestible nor nutritious.

Digestion can be left severely alone when we deal with fowls. Chickens with weak digestions never reach maturity, and grown fowls, except in cases of gross neglect, rarely suffer from any serious derangement of the digestive organs. Nutrition begins where digestion ends, with the entrance of the digested food material into the blood. Suppose this food material was originally starch. It has been acted upon by the digestive ferments, and is starch no longer, but it still contains no nitrogen. Now the process of flesh formation demands the presence of nitrogen, and, such being the case, our digested starch can only fulfil one function in the body, the production of heat. If it is not required for the production of heat it is so much waste, and will either be deposited as fat somewhere in the tissues, or will remain in the blood until eventually cast out by means of the liver. As long as this excess carbonaceous matter is present in the blood, it will give rise to those unpleasant symptoms called "biliousness." Fowls, unfortunately, lack one means of ridding themselves of this excess, which we humans possess, *i.e.*, perspiration; but they make up for this missing function by an increased tendency to lay on fat, a mere reserve of fuel hardly ever drawn upon in health, and never utilised by

fowls which are properly tended. Fat, in fowls intended for laying is highly objectionable, if deposited in any quantity, for it decreases activity, which is the principle condition of a good egg yield. A small reserve is necessary, it is true, to tide over a sudden drop in the temperature, but beyond this all fattening is to be avoided. So much for the carbonaceous side of the diet.

Let us imagine that the food digested is raw lean beef. This will provide no heat, but on the contrary require heat to assist in its eventual transformation into flesh. If the fowl be capable of assimilating this food, that is to say, if it be in good health and fairly active, it will go to replace wasted muscle or assist in forming new tissue; or if required for neither of these purposes it will usually go towards increasing the egg yield. But it can neither build up the body nor produce eggs if the material for heat production be absent. As nitrogenous food is expensive we rarely hear of an excess thereof doing any harm, since the error is seldom made in that direction. In America, however, where egg forcing is carried to extremes, the evil effects of excess nitrogenous food are frequently noted, the least of which is a complete nervous collapse. Since excess in either direction is attended by nature's retributive measures, we are compelled to enquire whether we have any rule by which to judge the sufficiency of either food constituent. Such a rule, the nutritive ratio, does exist, as we have already stated based upon the observed fact, that a certain definite proportion of heat producers to flesh formers is required to maintain the vital functions in healthy activity and replace wastage. This proportion is generally considered to be 9 parts by weight of heat producers stated as carbo-hydrates to 2 parts by weight of fleshformers (albuminoids or proteids) when the average temperature of the external air is 60 degrees Fahr. As the temperature rises above this, the heat producing constituents of the diet must be reduced until in our hot Novembers and Decembers the carbo-hydrates should stand to albuminoids as 4 to 1, or even lower, and the total ration be decreased in weight by the amount of deducted carbo-hydrates. In practice it is found necessary to give a portion of the heat producers in the form of fats (hydro-carbons), and within certain limits, the higher this proportion the better. As far as I can judge the

limit should be one half of the whole carbonaceous ration and should never fall below one fourth; but on the other hand Dr. Jewell, a most reliable authority on poultry feeding, considers one fifth more than ample.

We know that the heat-producing constituents of food are either hydro-carbons (fats) or carbo-hydrates (starch, sugars and gums), but we must take care in calculating our ratio to allow for the fact that, weight for weight, the fats produce much more heat than the other group, in fact about $2\frac{1}{4}$ times as much. We must, therefore, multiply the amount of fat shown by analysis to be present in a certain food by that figure, and, having done so, add the result to the amount of carbo-hydrates present. The sum of the hydro-carbons, thus multiplied, added to the amount of carbo-hydrates shown by the analysis to be present, is then divided by the percentage of albuminoids. The quotient gives the nutritive ratio.

Below, a table showing the constituents of the principal poultry foods, is given:—

Article of Food.	Nutritive Ratio.	Albuminoids Flesh Formers.	Heat Producers		Salts and Minerals.	Fibre.	Water
			Fats.	Carbo-Hydrates.			
Beans and Peas ...	3:5	24.0	1.5	48.0	2.5	10.0	14.0
Bran ...	2:7	15.5	4.0	44.0	6.0	16.5	14.0
Barley ...	1:5	12.0	1.4	56.0	3.6	14.0	13.0
Buckwheat ...	1:6 $\frac{3}{4}$	10.0	2.2	62.2	2.0	11.0	12.6
Biltong ...	10:1	72.0	3.0	0.3	14.7	0.0	10.0
Bone (green) ...	1:3	20.2	26.1	0.0	24.0	0.0	29.7
Beef (lean) ...	5:2	20.5	3.5	0.0	1.6	0.0	74.4
Cabbage ...	1:2	2.4	0.4	3.8	1.4	1.5	95.5
Inyoti ...	1:7 $\frac{1}{5}$	11.3	4.3	71.3	2.2	1.5	9.4
Kaffir Corn ...	1:8 $\frac{1}{4}$	9.9	3.0	74.9	1.5	1.4	9.3
Lucerne Hay ...	1:2 $\frac{5}{6}$	17.4	2.4	43.5	10.2	18.5	8.0
Linseed meal or oilcake	1:1 $\frac{2}{3}$	32.9	7.9	35.4	5.7	8.9	9.2
Mangolds ...	1:7 $\frac{1}{4}$	1.4	0.2	5.5	1.1	0.9	95.9
Maize ...	1:8	10.5	7.5	67.0	1.5	2.5	11.0
Manna ...	1:11 $\frac{1}{5}$	2.4	0.6	13.1	1.9	7.0	75.0
Milk ...	1:3	4.5	3.7	4.9	0.9	0.0	95.6
Monkey nuts ...	1:3 $\frac{4}{5}$	27.9	39.6	15.6	2.4	7.0	7.5
Onions ...	1:3 $\frac{1}{2}$	1.5	0.2	4.8	0.5	2.0	91.0
Potatoes ...	1:6 $\frac{1}{2}$	6.5	0.0	41.0	2.0	0.0	50.5
Rapoko ...	1:10 $\frac{1}{5}$	7.6	1.3	74.5	3.1	2.9	10.6
Rice (imported) ...	1:12	6.6	0.4	80.0	0.0	0.0	13.0
Sunflower seed ...	1:4	16.0	21.5	21.4	2.6	29.0	9.5
Wheat ...	1:6 $\frac{1}{6}$	12.0	1.8	70.1	1.8	2.3	12.0
Oats ...	1:4	15.0	5.5	48.0	2.5	19.0	10.0
Rye ...	1:7 $\frac{1}{2}$	10.5	1.8	72.5	1.9	1.7	11.6
Velvet Bean hay ...	1:3 $\frac{2}{5}$	13.3	2.6	39.2	7.8	27.6	9.3
Skim Milk ...	1:1 $\frac{1}{2}$	4.0	0.3	5.3	0.7	0.0	95.6
Eggs ...	1:2 $\frac{6}{7}$	14.0	16.0	0.0	1.0	0.0	69.0
Eggs (yolk only) ...	1:4 $\frac{1}{5}$	16.0	30.0	0.0	1.0	0.0	53.0
Eggs (white only) ...	2 $\frac{3}{5}$:1	12.0	2.0	0.0	1.2	0.0	84.8

From the above table it will readily appear that very few grains or seeds satisfy our requirements. Maize, which is a grain most largely used as a poultry food, has very little more than half of the albuminoids required to promote healthy growth; while rye, which is largely fed to fowls in certain districts near Cape Town is very nearly as bad. Pulse, with the high ratio of 3:5, might be used as a corrective for these grains, were it not that the fats in pulse stand so very low. Linseed meal, with a higher percentage of fats, can be used to correct the deficiency in proteids apparent in maize, but will not serve over well for mixing with a dry grain like rye. Linseed itself is usually too expensive for use as poultry food. Sunflower seed, however, will balance even rye or rice, if fed in sufficient quantity; but it is clear that, if we are to confine ourselves to maize or rye with sunflower seed as a corrective, the amount of the corrective will need to be very greatly in excess of the grain, and the consequent saving in cost so slight as to hardly worth our trouble.

Since local circumstances and prices must always rule our choice of diet, it would be useless on my part to suggest any specific mixture. Every poultry keeper must fix upon his own combination. In order, however, to facilitate calculations, the formula given below may be advantageously used, viz:—

$$9(a + cy) = 2(b + dy)$$

Here a is the percentage of protein contained in the main feed and b the percentage of heat producers, i.e., the fats multiplied by $2\frac{1}{4}$ added to the carbo-hydrates. C represents the proteid content of the corrective and d the heat producers therein. A simple calculation will give the value of y , which will be the number of pounds weight of the corrective required to balance one pound weight of the main feed. This will usually be a fraction.

For the benefit of those who do not possess the slight knowledge of algebra required to solve the stated equation, a few recipes for combined rations follow. These will be found reasonably satisfactory.

1. Beans 9lbs., maize 20lbs., suet 1lb.
2. Bran 17lbs., maize 8lb., suet $\frac{1}{4}$ lb.
3. Maize 7lbs., green bone 3lbs.

4. Sunflower seed 1lb., oats 4lbs.
5. Sunflower seed 19lbs., beans 4 lbs.
6. Sunflower seed, 2lbs., barley, 10lbs., oats, 10lbs.

Of all these the last is by far the best, and, if occasional extra rations of green bone, lean meat, and plenty of green food be given in addition, there is no finer laying ration possible. In practice number 6 can be advantageously varied by, say, three days per fortnight giving number 3, or better still, by once a week substituting a ration of green bone and lean beef, balanced by some simple green vegetable or even fine cut grass.

It must not be forgotten that greenstuff is a *sine qua non*, when we aim at increasing our egg yield. Fowls on a free grass run require little green food in summer and early autumn, but during the rest of the year they should be as well supplied with greens as their pent up sisters. If green stuff is not available sour milk will do almost as well, and lukewarm whey will also serve at a pinch. Purging must be guarded against if whey is given.

When rations of various grains are fed, the oilier grain should be given at night, the nitrogenous foods in the morning. Mixing grains is not to be recommended, for fowls will always pick out their favourite grain and leave the rest. When beans form a portion of the diet they should always be well boiled and then passed through a disc mincer, or pounded into a porridge-like consistency, the fat being added during pounding or mincing. Meat also should be minced, but fed raw. Grain ought never to be soaked or boiled, for there is nothing more productive of trouble in a flock than such treatment of the grain ration. Many poultry-keepers excuse themselves for their mistakes in this direction by stating that, as their soil is deficient in hard grit, they consider their fowls do better, if their food is softened for them. The reason why whole grain with plenty of grit is superior to boiled grain, with or without grit, is very simple. Boiled grain passes through the gizzard before the digestive ferments have had time to act upon the food, and the process of digestion must therefore be completed, if ever, in the intestines. As a matter of fact, a great deal of foodstuff is wasted in this way, for a large proportion of such boiled food is voided undigested. Bran, however, requires steaming, not

indeed as some suppose, to render it more digestible, but to aid the process of deglutition.

Some of my readers may have noticed that nothing has been said as yet about the very important question of mineral salts, lime, phosphorus, iron, etc., which must form a portion of every proper dietary. It is usual, however, to neglect this question, since most grains contain a fair proportion of salts, and the balance necessary is usually supplied by an occasional ration containing bone, varied by a bran mash, while green food also supplies a great proportion of the necessary salts. Iron, however, is very often absent from the dietary and should be supplied by adding a teaspoonful of a saturated solution of sulphate of iron to every gallon of the drinking water. This is especially necessary during moult.

Reference has already been made to grit. No excuse is admissible for failure to supply this in sufficient quantity. Any Rhodesian river bed provides it plentifully, and, if no rivers are at hand, roughly powdered quartz will supply the need. Where hard flint is available, this should be used without stint.

Pounded glass and crockery is sometimes given to fowls with evil results on account of the lead contained therein, and such substitutes for grit should be avoided. Grit crushers are sold by most dealers in poultry appliances, and are well worth the money they cost, for not only can good sharp grit be provided with a minimum of trouble, but they can be used for crushing bone for feed, which they do much better than a pestle and mortar.

Cleanliness in feeding is a most important matter, for if disease breaks out amongst a flock, it can generally be traced to contamination of the food, feeding vessels or feeding ground. The feeding place should be carefully swept after each meal, and an occasional dressing with fresh limewash, in which a small quantity of carbolic acid or other disinfectant has been mixed, will go far to prevent disease.

Meal times are still a matter of dispute amongst poultrymen. Some feed once, some twice a day; a few even give a mid-day meal. Where fowls are kept on a close run, they should be made to scratch for every mouthful they get, or

they will become fat and lazy, storing up the heat producers in the body and getting rid of the nitrogenous matter by way of the kidneys, instead of converting it into flesh and eggs. To keep them busy and contented the American plan of a scratching shed is far the best. In Rhodesia the shed may consist of four walls of wattle and daub with a thin grass roof to keep off the sun. The floor should be covered six inches deep with short chopped straw or other litter; into this small grain should be thoroughly worked with a fork. Inyouti, rapoko, oats or barley will do equally well, for the object is not to feed them in this way, but to keep them busy and contented. Whether a mid-day meal is given or not, the flock should receive a full meal—it cannot be too full—about half an hour before sunset. In winter breakfast is necessary and should be given as soon as the birds leave the roost. It should not consist of maize, but of smaller grain, such as oats, barley or inyouti. If maize must be fed, it should be cracked or given in the form of stiff porridge for a morning meal; but at night it should be fed whole. If fat is given the morning is the proper time. Breakfast should always be a scanty meal, and in summer, on a free run, should be avoided altogether. Its place can then be taken by a light meal of small grain given at about ten o'clock. Charcoal (not charred wood) may with advantage be roughly pounded and scattered in the litter of the scratching shed. It prevents distension and slackness of the crop.

So far it has not been considered advisable to speak of egg-forcing. This requires abundant green food, preferably lucerne or cabbage leaves, to enable the extra ration to be assimilated. Cayenne pepper and raw flesh are the usual additions to the diet, but if stock is intended for breeding it must not be forced in this way, or rather it must not be forced at all. Let the breeding pen be well but not be over-fed; keep the birds active and the chicks will be strong and healthy. Forced eggs never hatch well, and when they do hatch the chicks are usually wasters.

During moult green food should be plentiful, and no better grain can be given than whole oats with sunflower seed. An iron tonic such as already advised becomes necessary as soon as the feathers drop. If it is desired to hasten the moult, the best treatment is to shut the birds up for three

days in the dark of a well ventilated shed and give water only sparingly and food not at all. If this is done towards the end of January the feathers will usually drop straight away and, with a diet of oats and sunflower seed, the new plumage is put on in record time. An excellent condition powder for use during moult is made as follows :—

Take of Fenugreek, aniseed, cummin, sulphur and caraway seed, each 1lb., of linseed meal, 5lbs., of copperas (sulphate of iron) 4ozs. Pound the seeds in a mortar with the copperas, add the sulphur and linseed, and mix intimately. Give one tablespoonful to twelve birds, well mixed with any meal or kind of porridge, first thing in the morning on alternate days throughout the moult.

Small chicks require both different treatment and different feeding to grown fowls. When chicks begin to feed, they should receive a meal consisting either of white of egg, hard boiled, or curds which have been sufficiently heated to cause partial, but not complete, coagulation. For the benefit of those few who do not know how to prepare curds for chicken food, it may be as well to state that skim milk a day old is heated gently in an open vessel such as a milk pan, until the whey begins to separate. The mass of semi coagulated curd is then skimmed off with a saucer or soup plate into a colander, where it is left until most of the whey has run off. The nutritive ratio of ordinary curd is about one to two and its food value nearly three times that of an equal weight of lean beef.

During the first day curd should be fed alone, on the second day oatmeal should be added to the ration and the curd or egg gradually diminished, until at the end of the first week oatmeal moistened with milk alone be given. The chicks should, almost from the shell, be accustomed to pick up small grain such as inyouti, and grit should be supplied with all soft food, sprinkled thereon as if from a pepper castor. At the end of the first week crushed oats should be fed, and an occasional feed of bone meal mixed with oatmeal and milk will do good. Maize should never be given to chickens in any form. Kaffir corn and rapoko are also highly undesirable foods. Inyouti, in small quantities, is less objectionable, but, except to keep them amused, its use is not

to be recommended. Oats, and oats alone, are the true poultryman's standby, with milk as a beverage. When the chicks have reached their third week the supply of curds should be renewed, but they should not receive more than a dessertspoonful apiece. If they are hand reared they may be kept amused by hanging a piece of raw tough meat about three inches above the floor, and whole oats should be buried in light litter, to teach them to scratch.

There are a good many patent chicken foods on the market of which Spratts' Patent supply the best, but they are all more expensive than oatmeal and not a whit more nutritious. Colonial oatmeal of good quality can be landed in Rhodesia for about 30/- per bag of 100 lbs., and locally grown oats do not usually cost more than 25/- per bag of 150 lbs. Taking these prices as our basis, it will be found that it costs 16/8 to raise 100 chicks to the age of six weeks, or 2d. per chick. After that age they become voracious feeders and stow away vast quantities of food; yet in the long run oats at 2d. per pound will be found cheaper food than maize at 3/4d.

From an old note book I extract the following:—"75 chickens hatched June 27th, 1896, consumed 10lbs. oatmeal, 20lbs. oats up to 8th August. From 8th August to 1st September (72 being still alive) they consumed 84 lbs. of oats; during September 180lbs. were disposed of; October saw an increase to 280 lbs. On the 27th November, after consuming a further 300 lbs., the birds were weighed and scaled 401 lbs., or an increase in weight since hatching of about 390 lbs. for an expenditure of 874 lbs. of oats which cost about £6, or 1/8 per chicken." On maize Minorca chickens of five months could never be brought to these weights. On a diet whereof maize formed a part, I obtained weights less than these in seven months at a cost of £5 15s. for a brood of 78 out of which only 70 were raised as against 72 out of 75 in the case of oats. Roughly speaking it costs 1/6 to feed a chicken to six months on maize as the main feed at 12/6 per bag, and something less than 2/- to feed it to a like weight and maturity on oats at 25/- per bag. The oat fed chickens are, however, ripe fully a month before their maize-fed mates and are much finer and healthier birds.

Very young chicks require their food to be thrown upon the ground, but in a few days time they learn easily to take it from a vessel. Most dealers in poultry requirements sell guarded feeding troughs, which prevent the chickens from scratching the food out and fouling it. The cost of these is very slight, and is soon saved. One month's waste of fouled food will more than swallow up the cost of proper utensils. The galvanised zinc drinking vessels manufactured by Tamlin and the earthenware one sold by Spratts' Patent are also highly to be recommended, both as time and life savers. Small chickens are so easily drowned in the drinking vessel.

In conclusion it is only necessary to point out that if we want big chickens we must supply them with bone forming material. If oats form the staple food it will hardly be necessary to do more than strew burnt bone or animal charcoal about the run. The same food that puts bone into a Highlandman will put it into a chicken. But if oats are not the staple food, then bone meal *must* be added to the ration so that each growing chicken gets at least an ounce per week, and an occasional bran mash will also improve matters. There is only one rule in poultry feeding and it is: quantity without quality and proportion is valueless. The best is never too dear; inferior food is dear as a gift.

Agricultural Shows.

Owing to existing restrictions on the movement of cattle, the unusual drought of the past season and other causes, the ordinary winter show of the Salisbury Agricultural and Horticultural Society will not be held. It is proposed to call a general meeting of all persons interested in the objects of the Society, about the 1st of September, for the election of office-bearers, discussing a programme for the ensuing year and the laying out of the new show ground, etc. A show and sale of seed mealies, potatoes, etc., will be held in connection with this meeting, and it is also hoped to arrange for an agricultural dinner.

There has been nothing done so far towards arranging a show at Bulawayo, and it is unlikely that one will be held there this year. The Umtali show will be held on the 11th and 12th July, and the Committee are now busy with the arrangements.

The Supply of Pigs to Bacon Factories.

By REGINALD C. SIMMONS,

Chief of the Animals Industry Branch.

During a recent visit to England and Ireland, the writer had an opportunity of inspecting various bacon factories and pig breeding establishments and of discussing with the owners and managers the question of the supply of raw material to the factories, with reference both to the quality of material required and the most economical methods of producing it. I visited the Dunmow Flitch Bacon Factory at Dunmow, Essex; Messrs. Oake, Woods & Co.'s factory at Gillingham, in Dorsetshire; The Roscrea Bacon Factory at Roscrea, County Tipperary, Ireland, and Messrs. I. & T. Sinclair's factory in Belfast. I also visited pig breeders in Essex, Berkshire, Hampshire, Dorsetshire, in the districts around Belfast and Dublin, and in the West of Ireland.

All over the country I found that the pig most in demand was one weighing from 130lbs. to 170lbs. dead weight. One cannot yet tell exactly how the trade will develop in Rhodesia. It may be that a profitable outlet will be found for pigs of greater weight than this, but by way of being prepared to supply the factory when it arrives the farmer may safely aim at producing pigs of the above weights, and perhaps he will be wise to keep on the lighter side rather than the heavier.

The following extract from the Wiltshire Bacon Curers' Association price list for March last indicates very fairly the kind of carcass that pays best in England:—

“Our prices for prime quality pigs, until further notice, are as follows:

Prime Stores.	Per Score (20lbs.)
130lbs. — 170lbs. dead weight	... 10/-
171lbs. — 190lbs. ...	... 9/9
191lbs. — 210lbs. ...	... 9/6
211lbs. — 230lbs. ...	... 9/3
Pigs outside these weights at their value."	

I have expressed the weights in lbs. for greater convenience; the custom in Wiltshire is to weigh by the score. Besides conforming to the above weights, a pig is required that will produce a good long side—thick in the belly or streaky part—not too thick in the back—fine in the shoulder and forepart, and heavy in the hams and hinder parts. Pigs with heavy coarse fore part and shoulders and too thick in the back, probably with scarcely any lean meat on the belly when dressed are not profitable. Pigs much over seven or eight months old are not so desirable, as the bacon has a tendency to be hard, and they are less profitable to feed after eight months.

Last year Mr. Loudon Douglas advised farmers to import the Large Black breed, and I am of opinion that he was right. Mr. Douglas, however, rather conveyed the impression that all other breeds might be dismissed from our minds as unsuitable, and in this respect I am unable to agree with him. Until properly conducted experiments in different parts of the country have been carried out, it is impossible for anyone to say positively which the best breed or breeds may be. In the absence of exact local knowledge one may at least be guided by the experience of factories and breeders in the Old Country as a basis from which to start our own investigations. I think that, in addition to Large Blacks, Large Whites and Berkshires, properly housed and fed, may meet with a measure of success in some localities, if not in all.

Touching on the tendency of pigs to deteriorate in this country, I am doubtful if any breed will be found to maintain its European standard of quality without occasional infusions of imported blood. This necessity, however, should it be found to exist, need not deter anyone from pig breeding provided other conditions are favourable.

I find that for bacon purposes the various English factories advocate a cross-bred pig, preferably the progeny of a Large White boar, on a Berkshire or Large Black sow. Such pigs are liable to occur with a good deal of white about them, and on first thoughts this appears to be an objection from the Rhodesian point of view. When, however, it is considered that the fattening pigs will not be, or rather, should not be more than eight months on the farmer's hands, and that at no time during that period will it be profitable for any reason to expose them unduly to the hot sun, the objection ceases to bear weight. The sows of course under this system are black, and the white boar can easily be sheltered.

It is held to be of the first importance that the first cross only should be utilised, and that both boar and sow should be pure bred.

In Ireland the white pig (mostly Large White Ulster), predominates almost to the exclusion of any other breed. The use of black breeds has been discouraged largely on account of the fact that American bacon is mostly made from black pigs, and it is thought that the presence of stray black hairs on bacon might induce the public to think it was American, and not Irish. This idea prevails especially in the North of Ireland, where the pigs are killed on the farm and the carcasses sold to the factory. The Ulster White Pig is very similar to the Large Black in conformation and habits, but is quite white with very little hair. I do not think we need concern ourselves with this breed at present, as it is scarcely a fixed type yet. Its principal quality is an exceedingly fine fore-end and shoulder. The hind quarters are not quite what is desired, and breeders are seeking to remedy this.

The Large Black does not appear to be very popular in any of the factories I visited. I gather that the pure bred pig is not a very remarkable weigher, and not very suited to a cold country. This latter attribute may possibly account for its want of popularity. Large Black sows are generally admitted to be good milkers. We all know they are fine in the shoulder and fore part. The cross, therefore, with the Large White gives a lengthy side, thick in the belly or streaky part, with as little fore-end or cheap meat as

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possible. The dams, having as a rule plenty of milk, the progeny may be expected to thrive.

Pure bred Berkshires, although early maturing tend to thickness in the shoulders, and if at all coarsely bred to thin bellied sides—a bad fault. The Yorkshire cross apparently corrects these faults.

When first the question of improvement of the methods of pig raising was seriously considered, farmers were all rather alarmed at the cost of what appeared to be necessary in the way of housing. In fact the requirements were prohibitive. Now as I have only recently become responsible for the advice tendered to breeders on this and other kindred matters, I wish it to be clearly understood that my experience of pig breeding extending over a matter of 20 years, and my recent investigations at Home have led me to the very decided opinion that the nearer the styres and general accommodation approach to the ideal as laid down by Mr. Loudon Douglas the better will pigs thrive, and the more profitable will they become. On the other hand pigs can be made to do fairly well with much less elaborate accommodation, and I do not for one moment suggest that a farmer should put more capital into his piggeries than the pigs will pay interest on, or make an outlay on pigs that will cripple or hinder his finances and his other farm operations.

I advise the average farmer to start on a small scale, at first say with even as few as half a dozen sows, but to do these sows as well as he possibly afford to. The existence of a factory, and the consequent constant market for pigs of a given quality and weight will enable every farmer to keep his herd within whatever limits he may decide on as suitable to his farm and means. The old South African complaint of "Oh, I was over-run with the brutes in about twelve months, and did not know what in the world to do with them" need never be heard. The principal points which must always be borne in mind when building pig styres are as follows:—

Dryness, equitable temperature, shelter from the direct rays of the sun, roominess, light and air. Styres should be easily cleaned, planned so as to afford as little harbourage

for vermin as possible, with good flooring, non-absorbent by preference. They should be situated near to grazing or exercising paddocks, and should contain moveable wooden sleeping boards for all pigs if possible, but certainly for brood sows and young. Breeding styes should have protective rails round the walls to prevent the sow lying on her litter—these can be built of wood. The ideal is probably a brick building with high iron roof, well pointed walls, cement floor, iron or wire divisions and iron troughs; the whole sty, both sleeping and exercising portion being under one roof. The cheapest style I can recommend the farmer to start with is a brick built sleeping compartment with good high roof of iron or thatch—walls well pointed with lime on the inside; the outside yard and internal divisions being of wire netting, or wire, or both on wooden poles well tarred. The floor may be metalled like a roadway, the earth being previously removed for about a foot, and the whole floor made with a good slope from back to front before the walls are built. The boar should be separately housed. I strongly recommend wooden sleeping boards and protective rails in brood styes. Galvanised iron troughs are best, but if they are too expensive use small wooden ones, and let them be well boiled once or twice a week to keep them sweet. As the pig business develops and will pay for more elaborate accommodation, so the buildings may be improved with a view to increasing cleanliness and saving labour.

When considering the use of various foods much naturally depends on their cost and availability. The present price of mealies is prohibitive as pig food in most parts of Rhodesia. The market will change again, as it always has in the past, therefore I make no apology for recommending mealies as a pig food. In certain experiments conducted by the Wiltshire County Council various food mixtures, of which barley meal was the basis, were found to top the list of foods for making the best quality of bacon. Barley does not concern us in this connection at present. Next in order after the barley meal mixtures came maize meal mixtures in the following order:—Maize meal and bran, maize meal and bean meal, maize meal and separated milk, maize meal alone, maize meal and pea meal. It is interesting to note from this table that maize meal and bean meal were found superior to maize meal and separ-

ated milk. The following extracts from recommendations issued by the Western Bacon Curers Association in Wiltshire to their customers is of interest. One may substitute the word mealie meal or mealies for barley meal, and pumpkins or sweet potatoes for potatoes:—

“For fattening soak the meal in cold water; use barley meal as the staple food; supplement this as far as possible with *fresh* (not stale) separated milk, skim or butter-milk at the rate of about one gallon per pig, per day, and, when procurable, by boiled potatoes, not more than three or four pounds per pig, per day.

When cheese is made it is well to supplement the meal whey by about one pound of bean or pea meal per day.

Where dairying is not carried on bean or pea meal may be used as a substitute for milk.”

Generally speaking, I gather that 50% is the greatest proportion of mealies or mealie meal which can be used in the production of good bacon; that the addition of a small quantity of bean meal (especially for finishing) is a distinct advantage; that potatoes, sweet potatoes, pumpkins, and other roots are very valuable adjuncts to the feed of pigs; that very particular attention should be paid to the supply of water and succulent food, especially to brood sows and pigs under four months old.

On several occasions I saw pigs being fattened in large lots of 30 or so in covered yards; the advantage of these large lots seemed to be principally the manure made in the yard. I recommend not more than eight or ten in one sty for fattening in this country, and if allowed to lie on accumulated manure great care must be taken in respect of vermin and damp beds. I gathered no information which led me to think that the system of grazing pigs on growing mealie crops will be very advantageous. This point can only be decided by experiment. I am told that buckwheat (fed on the haulm), inyouti, and other native grains are excellent food. On these points I shall be grateful for the experience of farmers and others.

In conclusion, I would add that, whatever feed is adopted, half the value of it depends on the method of feeding it to the animals—pigs in styes require feeding with the same amount of care and judgment as horses, cattle, or any other domesticated animals.

No hard and fast rules can be laid down, but the following principles may be noted :—

1. Keep the troughs clean and sweet.
2. Regulate size of meals so that the animal finishes up each meal clean.
3. Feed three times a day at least.
4. If any variation is made give preponderance of solid foods night and morning and succulent foods mid-day.
5. Let sows and young pigs up to four or six months have plenty of water or its equivalent in succulent food.
6. While remembering that growing pigs want exercise, do not let them roam too far in search of food or pasturage.
7. Brood sows in pig want plenty of exercise and succulent food and water supplemented by a little daily solid food.

Some Insect Pests of Maize.

By RUPERT W. JACK, F.E.S., Government Entomologist.

Maize in Southern Rhodesia is not generally subject to a large number of very serious insect pests, so that it has come to be considered the safest crop of any to grow. At the same time there is no doubt that there is a considerable loss from insect attack every year, which passes almost unnoticed by the farmers. A fair stand is the rule with maize, a really good stand is rare. The farmer is apt to put down all the missing plants in his land to the fault of the planter. Certainly there appears to be no make of planter which does not miss more or less frequently, but a good planter does not miss 20% of the seed that it should deliver, and yet this amount of loss has been counted on a measured acre of land, which was reckoned to carry a good stand at the time. That a planter working on land in good tilth can deliver up to 95 per cent. of the grain that it should, has been observed, and if properly attended to no planter should deliver less than 90 per cent., and few as low as this. A farmer then, who has only a 75 per cent. stand, has usually something else than the planter to thank for the bulk of the loss, and insects will be found to be the offenders in the majority of cases. Now a loss of 15 to 20 per cent., due to insect attack, is a serious matter. It may make all the difference between a good profit and a poor one on the undertaking. If the crop only averages $6\frac{1}{2}$ bags to the acre, which would otherwise yield eight bags, the monetary loss from insect attack can be appreciated. Yet many a farmer is losing nearly as much as this annually and is unconscious of the deficiency.

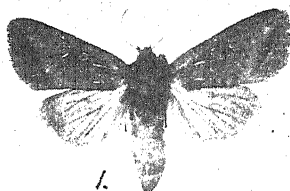
In the following article no pretence is made to a complete list of the insects which attack maize in the territory. The insects of economic importance observed up to the present time are included. Doubtless others will come to light in the course of time.

The Maize Stalk Borer.—This insect, otherwise known as the “Mealie Grub” (*Calamistis fusca*), is a native of Africa, and is the most serious pest of maize in many parts of the sub-continent. Its life-history has been studied in Natal, in the Cape Colony, and to a certain extent in this territory, and appears to vary but little in the different parts.

The *adult moth* is shown at Plate 1, Fig. 1, the figure being life-sized. The colour of the fore-wings is bronzy brown, the hind wings being yellowish-grey. The moth varies greatly in size, according to the amount of nutriment obtained by the larva or “grub.” The moths are on the wing in November and December and again towards the end of February and in March, the insect producing two broods in the year. The reddish-brown *pupa, or chrysalis*, is shown at Plate 1, Fig. 2. The pupa is to be found naked inside the maize stalk. The duration of this stage in neither brood is very long, lasting about a fortnight to three weeks (Mally), in September, October and in February. The *larvæ (borers)* are to be found inside the stalks from April—October and November—January. The young and full grown larvæ are shown in the plate (Figs. 3 and 4). The young larvæ are pinkish in colour, the full grown ones being of a dirty white. The eggs are laid, as a rule, inside the leaf sheath in a straggling double row. A cluster found by the writer numbered thirty-three.

When the young larvæ hatch they do not bore directly into the stalk of the plant, but feed for some time within the leaf sheaths, puncturing the leaves of the young plants with numerous holes, which have a characteristic appearance when the leaves grow out. The young larvæ of the second brood are to be found in the younger parts of the plants, under the leaf sheaths, under the envelope of the cob, etc. Later they bore either into the stem or the cob, and in this situation pass the winter. When about to pupate the borer prepares an exit hole through which the moth emerges later.

The most important damage to the crop is done by the first brood to the young plants, a large percentage of which may be destroyed by the borer. This is especially the case with early planted maize, and most of the complaints



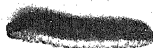
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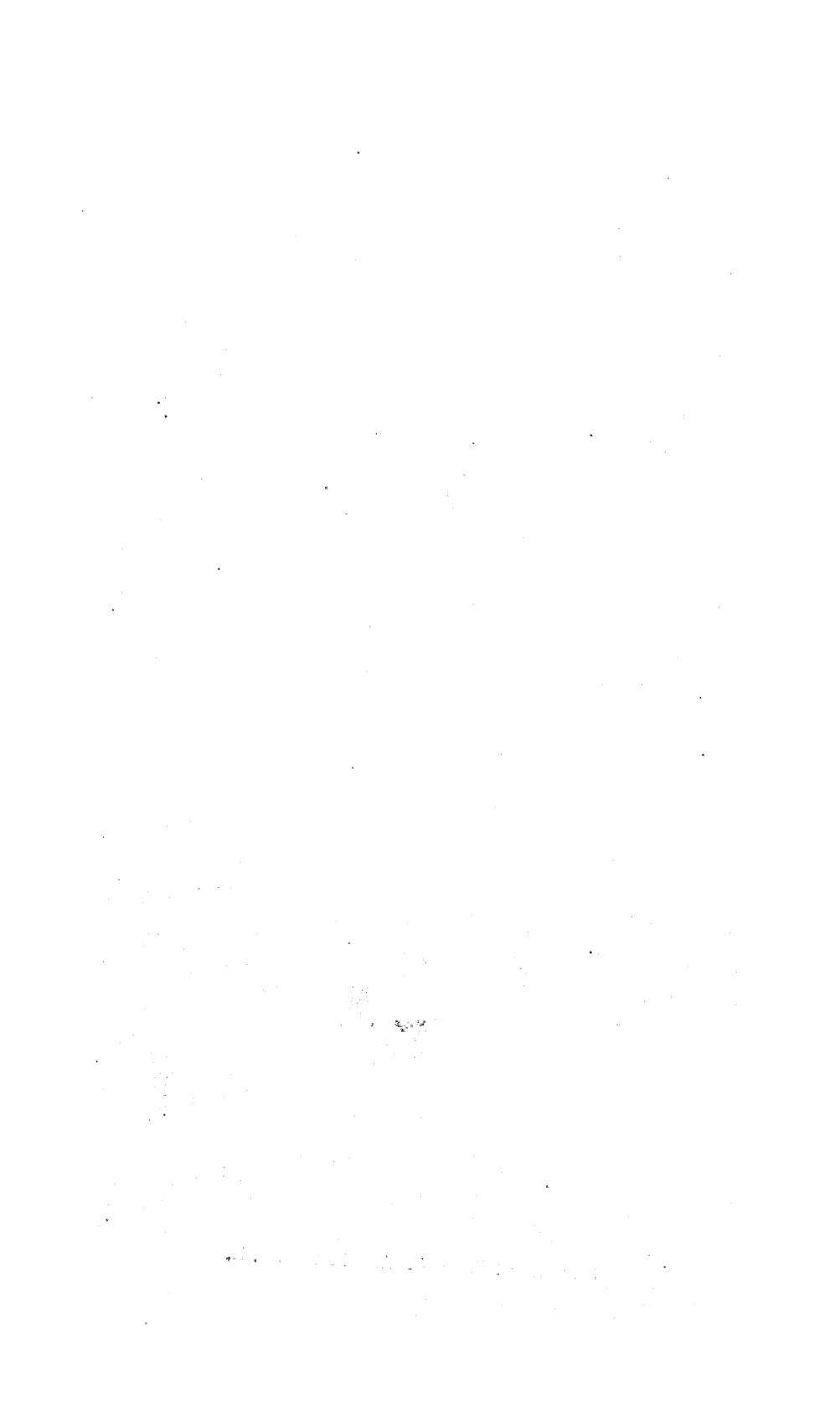


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6

Some Insect Pests of Maize. PLATE NO. I.



received concerning this pest in Southern Rhodesia have been from growers who hoped to reap the benefit of an early crop from naturally moist vleis ground. The presence of the second brood in the stems of the well-grown plants, although undoubtedly deleterious, does not have a very striking effect on the health of the plant, but when the infestation is bad a good deal of harm is commonly done by the borers working in the cobs, eating channels through the soft grain, as shewn at Plate 3. The second brood is very harmful to *Broom Corn* as the borers attack the head of the plant and commonly altogether ruin the crop of fibre. Other plants attacked are *Kaffir Corn*, *Teosinte*, different species of *Sorghum*, etc. Mr. Claude Fuller states that the borer is occasionally found in *Geranium*.

In Southern Rhodesia the losses from borer are not as bad as is indicated in reports from the Cape Colony and Natal. This is not due to any lack of capacity for increase on the part of the insect in this territory, but is probably attributable to the fact that maize is planted later here than in most other parts of South Africa, and late planting has long been known as one means of avoiding borer attack, due to the fact that under these circumstances the maize is not above ground at the time when the bulk of the moths are on the wing, and so to a large extent it escapes having eggs laid upon it.

The insect's method of attacking the maize plant is illustrated at Plate 3. Fig 1 shows the holes made in the stem by the borer. Fig. 2 shows the caterpillar inside the stalk, and Fig. 3 shows a split stalk revealing tunnels made by the borer.

The grubbing up and burning of the stalks during the winter months destroys the borers in the stems, where, as already mentioned, they pass this period of the year. This method of avoiding borer attack was tested by Mr. C. W. Mally in the Eastern Province of the Cape Colony, and recommended by him as effective. For success in this measure the co-operation of farmers whose lands adjoin is necessary. Care should also be taken to see that no Kaffir lands planted to maize or Kaffir corn are allowed to lie neglected over the winter, within half a mile or more of the

farmer's maize lands. Volunteer maize plants should be looked out for in odd corners and destroyed, in fact every care should be taken to eliminate all plants that might shelter borers, and breed moths to lay eggs on the young maize in the spring. It must be borne in mind that ploughing the stalks under is not sufficient to kill the grubs; the stalks must be destroyed down to the roots. Converting the maize into ensilage attains this end and saves waste where ensilage can be used, but this is only applicable to a limited part of the crop. Mr. Malley recommends the conversion of the maize stalks and leaves into fodder, which should be used or chopped in a chaff cutter before the following September; after this date it would be liable to yield adult moths. A description of the process of making maize hay lies outside the scope of this article, but the possibilities of obtaining the maximum value from the maize stalks and yet destroying the borer is mentioned here for the benefit of the enterprising. The writer is informed that this is the ordinary method of utilising the maize crop in parts of the United States, *e.g.*, Virginia. The advantages of this method of utilising the crop are:—(1) The maximum value of the crop is obtained, for even where the stalks are grazed off by cattle as is commonly done in Rhodesia, these stalks have lost a considerable portion of the nutritive value, through the cobs being allowed to ripen in situ. (2) The crop is removed early from the land. This is the most valuable feature of the process as it permits of the land being ploughed at the end of the wet season, and this is not only good for the land itself, but it is an excellent method of keeping cutworms in check, as will be seen later; (3) It enables a portion of the plant food taken from the soil by the crop, to be returned in the form of kraal manure.

Cutworms.—These insects call for attention as pests of most crops in Southern Rhodesia and elsewhere. Their ravages amongst the young maize are frequently very serious, and some loss occurs on almost all lands, each year, from their attacks. This is one of the pests which contributes to reduce stands of maize, the damage frequently being attributed to other agencies.

Cutworms are the larvæ of certain night-flying moths belonging to the genus *Agrotis*. In this territory the

commonest species appears to be *A. segetis*, an almost cosmopolitan species, known as the "Turnip Moth" in the British Isles. The *adult moth* is shown at its natural size at Plate 4, Fig. 1. The fore-wings are brown in colour, the hind wings being pearly white marked with narrow brown veins. The reddish-brown *pupa, or chrysalis*, is figured at Fig. 2. This stage is passed in an earthen cell in the ground. The *cutworms* themselves appear at Fig. 3. Those figured are full grown specimens nearly ready to pupate. They are of a dirty grey colour and have a rather greasy appearance. There is nothing particularly distinctive about the species in any of its stages, and it might easily be mistaken for one or more of its close relations.

The habits of cutworms are simple. The female moth lays her eggs on any suitable object such as a stone, the trunk of a tree near the ground, the stem of a plant, etc., amongst a plentiful food supply for the larvæ, which, when hatched, commence feeding on the first suitable plant they find. They remain about the same spot as long as food is plentiful, hiding in the earth by day and coming out to feed at night. Their habit of cutting through the stem of a plant about the ground level is well known, the object of this being probably that they may suck the sap that is forced up from the root of the severed plant. The life history of the various species of cutworms in Southern Rhodesia has not yet been followed in detail, but from the fact that caterpillars of all sizes are to be found at the same season of the year it is probable that *A. segetis* here, as elsewhere, has no definite broods, but passes the winter as a half-grown or nearly full-grown larva, and possibly also in the adult stage. The question of whether or not cutworms are capable of feeding up during the winter months in this territory is not settled, but the lack of succulent vegetation during the dry weather is a factor against it; the temperature, except in the coldest months, should be no great deterrent.

Preventative measures against cutworms consist in clean cultivation. A weedy piece of land provides an environment very favourable to the insects and will attract not only the caterpillars from the neighbouring ground, but also the female moths for the purpose of egg laying. Although the life histories of our native species

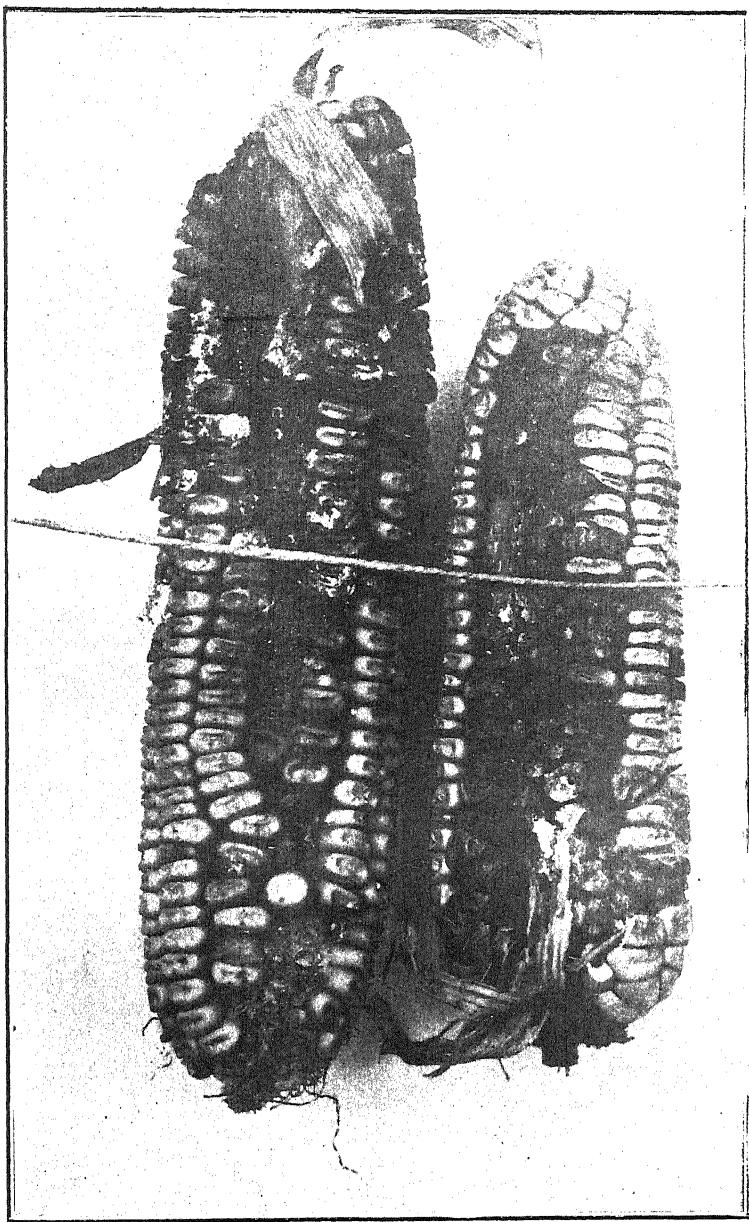
has not been studied in detail, it is known that the moths are on the wing in March, April and May. These moths are on the look-out for a suitable place to oviposit, and if there is a succulent undergrowth of weeds amongst the maize, a large number of cutworm eggs are likely to be deposited there. It is probable that the caterpillars hatching from these eggs will not mature before the next planting season, so the young maize may be expected to suffer. Herein lies the value from the cutworm standpoint of the fodder method of handling maize as recommended by Mr. C. W. Mally. If the ground be cleaned of its crop and ploughed in April, the weeds will be destroyed and the land will lie bare over the dry weather. In this way any cutworms already in the soil will be deprived of food during the months of April and May, when they may be expected to feed in the ordinary way, and there will be nothing to attract the moths to lay eggs on this land. Ploughing the land at the end of the wet season is good husbandry, where it can be practiced, and tends to check more than one insect pest. In this country, however, where there is so much natural veld around the ploughed lands, this measure should not be relied on altogether to check cutworms which may be breeding freely close by. Some method of attacking the cutworms directly is therefore desirable.

It has long been known that cutworms may be attracted to a mixture of arsenite, treacle and bran, and this is the method of destroying them, usually advocated in the United States of America. One mixture advised in the U.S.A. consists of:—

Paris Green	...	...	...	1 lb.
Molasses	...	...	...	2 qts.
Wheat Bran	...	...	...	50 lbs.

The molasses and the bran should be mixed together with enough water to bring the mixture to the consistency of porridge, that is to say, it must not be too stiff to prevent it running through the fingers. The Paris Green should then be thoroughly mixed. An adaption of the above, more suited to our local conditions and much cheaper, would be:—

Arsenite of Soda	...	...	...	1 lb.
Treacle	...	...	...	6 lbs.
Maize Meal	...	...	...	50 lbs.



Some Insect Pests of Maize. PLATE NO. III.

The Arsenite of soda should first be dissolved in a little hot water as it dissolves very slowly in cold. As this poison enters into solution it becomes more thoroughly distributed through the mass than Paris Green. The method of using the poisoned mash is to distribute it in little heaps (about a spoonful) about the land before planting takes place, and the operation should be performed on a dry evening. It will be seen at once that to carry out this operation on a large scale would involve considerable expense, and as a matter of fact it is seldom used for maize lands.

We are again indebted to Mr. C. W. Mally for the following adaptation of the old method of applying poisoned bait, which renders it quite an economic treatment for maize. Mr. Mally's formula is as follows :—

Arsenite of Soda	...	...	1lb.
Black Sugar or Treacle	...	...	8lbs.
Water	...	...	10 galls.

A quantity of green stuff should be chopped up finely, wetted with the above mixture and distributed broadcast, but quite thinly, over the lands towards evening. This method has been found to work quite satisfactorily, and it does away with the expense of bran or meal. The actual cost per acre of this treatment, exclusive of the labour, is not likely to exceed one shilling. If this treatment even adds 10 per cent. to the stand, and it is likely to add more in a large number of cases, the outlay will be many times repaid. Thus taking the value of the crop from 100 acres as £400, ten per cent. added to this means a gain of £40 for an outlay of perhaps £6 inclusive of labour. One hundred acres could be baited by six boys working about twelve hours, the bait, of course, being very thinly distributed. From three to six in the afternoon is the time during which the baiting should be carried out, so that if six boys be told off for the work the hundred acres could be finished in about four days. In many cases the writer is convinced that the saving on the hundred acres would be nearer £80 than £40, if the operation were thoroughly carried out, for not only cutworms, but certain pests also mentioned in this article would be destroyed by the poison.

Surface Beetles.—In the issue of this Journal for February, 1912, serious destruction of maize seed by two species of beetles, namely *Opatrum æquale* and *Emyon tristis*, was mentioned, and illustrations of the two pests were produced, as well as of seed damaged by their attacks.

These beetles attack the dry maize seed as it lies in the ground, bringing it to the surface for this purpose. *O. æquale* is the more active of the two in unearthing the grains, but *E. tristis* is quite as energetic in devouring them, once they are exposed. The grains may frequently be seen in the lands lying on the surface of the soil with the germ eaten out. The breeding habits of these beetles have been partially followed and appear to be similar. The white eggs are laid on the under surface of dead leaves and other rubbish in the field or on the earth itself just below the surface, and the elongate shiny grubs feed on this decaying matter. The larvæ have not been shown to attack living plants, but they may possibly eat roots at times. The adult beetles will not only attack maize seed as described, but commonly gnaw the stems of tobacco, potato, etc., and do no little damage when abundant. They have, however, not been seen to attack the growing maize.

The most serious damage to maize known to the writer from the seed-eating habits of these beetles was a loss of about 40 per cent. of the plants on a large acreage of land, representing a loss of £200 or more on one farm. This heavy damage was undoubtedly due to the dryness of the spring, the seed lying for over a week in the ground without germinating. The remainder of the seed was saved by the use of poisoned bait. If rain falls promptly after planting, the damage to maize by these beetles is likely to be small; if rain fails to fall for a week or more, the damage may be very serious.

These beetles may be easily destroyed by the use of poisoned bait as recommended for cutworms. It has been found that if ordinary grass be chopped up and wetted with the poisoned sweet, the beetles feed and die very readily. Another method is to take advantage of the fact that the beetles have a penchant for gathering in large numbers under rubbish in the field. If heaps of dry grass or

other inflammable material be collected about the field, large numbers of the beetles may be destroyed later by setting fire to the heaps.

Snout Beetles.—Several species of snout beetles feed on maize in the adult stage in Southern Rhodesia. These are native species which, in the ordinary way, would live on native plants and grasses, but, finding the young green maize very much to their taste, have contracted the habit of attacking this plant. The life histories of none of these species have as yet been studied. Their appearance is of a spasmodic nature, a species being abundant one year and scarce the next on the same piece of land. The worst outbreak known to the writer occurred in the 1910-11 season, when a species of snout beetle (Plate 1, Fig. 5) appeared on several farms near Salisbury and completely devoured the young maize over a large acreage. On one farm alone 250 acres were destroyed. The pest was sufficiently reduced by the latter part of December to allow of the third planting succeeding to some extent in the majority of cases, but the crop was small and disappointing from its lateness. This insect was figured in the issue of this Journal for February, 1911. During the past season this pest was hardly to be found in its previous haunts, but its place was taken to a lesser extent by another species that had occurred in very small numbers the previous year. This species is figured at Plate 1, Fig. 6. The damage from these snout beetles consists merely in the consumption of the leaves and stems of the young plants. Unfortunately, the absence of knowledge of the breeding habits of the insect renders it impossible to recommend any methods of control. Doubtless they could be destroyed by spraying with an arsenical insecticide, but this is not an economic measure that can be applied to maize in Southern Rhodesia at the present time.

Heteronychus Beetle.—This is an insect belonging to a different family from the two surface beetles already mentioned, and the damage performed is of a different nature. The beetle appears only to become a pest locally at intervals, although common enough throughout South Africa.

An illustration of the adult beetle is reproduced on Plate 4, Fig. 4. The colour is shiny black. The grubs are doubtless

similar in form to those of other members of the family, some of which are the well-known "white grubs," which feed on the roots of grasses and cereals, and others the dirty white "mestwurmen" found in manure heaps. It is probable that the larva of *Heteronychus* feeds on manure and decaying vegetable matter as a rule, though it may sometimes injure living roots. Unfortunately, practically nothing is known of the life history of this beetle. The injury to maize is performed by the adult beetle devouring or eating into the stalks just beneath the ground level. Lack of knowledge of the life history precludes the possibility of suggesting remedial measures.

EXPLANATION OF PLATES.

Plate 1, Fig. 1.—Maize stalk Borer (*Calamistis fusca*), natural size.

Fig. 2.—Pupa of above, natural size.

Fig. 3.—Young caterpillars of above, natural size.

Fig. 4.—Full grown caterpillars, natural size.

Fig. 5.—Snout Beetle (*Sciobius* sp.)

Fig. 6.—Snout Beetle (name unknown).

Plate 2, Fig. 1.—Maize Stalk, showing holes made by borer.

Fig. 2.— " " showing caterpillar in situ.

Fig. 3.— " " split to show tunnels of borer.

Plate 3.—Maize cobs, showing damage by borer to grain.

Plate 4, Fig. 1.—Cutworm moth (*Agrotis segetis*), natural size.

Fig. 2.—Pupa of above, natural size.

Fig. 3.—Cutworms (full grown), natural size.

Fig. 4.—*Heteronychus arator* beetles.

Rose Growing in Rhodesia.

By P. B. SNASHALL, F.R.H.S.

We may, I think, take it as one of the instances of the development of Rhodesia that the AGRICULTURAL JOURNAL is asking for an article on Rose Culture. It indicates that the farmers of the country are considered to be getting to that stage of settlement on their farms, when they should spare some of their time to the cultivation of the beautiful, as well as to the money-making products of the soil.

There seems some affinity, with our school Greek in mind, between the names "Rhodesia" and "Roses," and, although there are certainly no indigenous species of the rose in the territory, it is a source of satisfaction to lovers of the Queen of Flowers to know that with very little trouble roses can be grown here to compare favourably with the best grown in any part of the globe. It was, we know, one of the favourite flowers of Cecil Rhodes.

To compass the whole subject of the culture of roses for this country in a Journal article will necessitate much brevity, and it may be necessary to hold over portion of the subject to a later issue. I shall, therefore, confine my first remarks to those operations which require attention during June and July.

No time should be lost now in properly preparing the piece of ground in which it is intended to plant roses. For a rose garden, choose a piece of ground sheltered from heavy winds, with good loamy soil; if possible, with a good clay or gravelly clay sub-soil, and in a position where a good watering can be given at frequent intervals during the dry season. The best soil is undoubtedly a strong rich deep tenacious loam, of a heavy "greasy" nature, without being actual clay, well drained by resting on some porous stratum. Such a soil, trenched about two feet deep and with a shovel-full of wood ashes well incorporated with every square yard, is the ideal. Such are, however, not often found at a convenient

distance from the homestead, and the rose garden will usually be wanted near the house. Gravelly soils can be made suitable by taking out the gravel to the depth of two feet at least and good strong loam procured to take its place. An admixture of good clayey ant-heap and wood ashes with the loam will be an advantage. Some of the light soil should be mixed with the heavier for actual contact with the roots when planting. Sand is the worst soil of all, and unless the grower is prepared to replace the sand to a depth of at least two feet with good strong loam and kraal manure, with a fair admixture of clay or ant-heap, very little satisfaction will be obtained from roses on such soil. Tea roses will do the best on sandy soil, but there must be an admixture of loam and some clayey soil.

To be successful with the rose, it must be given a place to itself. It is next to impossible to bring the rose to perfection if surrounded by other plants. Occasionally one will find that popular rose "La France" thriving among Hybiscus and other shrubs, but it is the only rose that will do so under such conditions, and it is a peculiar variety in respect to treatment, in as much as growers, who consider themselves somewhat of experts, often have a difficulty in obtaining any decent blooms, while novices, who admittedly know nothing of rose growing, will have this variety growing to perfection. The "La France" must be considered an exception to the rule, and not as a guide for the treatment of other varieties.

It should, therefore, be decided to devote a certain portion of the garden to roses, and roses alone. Long and comparatively narrow beds are much the best. The shape of the beds may look too formal when prepared for planting, but no matter how artistic the shape, when we have roses thriving in them, no thought will be given to artistic curves or points in preparing the beds. Straight rows are the most practical and economical, and give by far the best results. Rose beds should be not more than five feet in width, and as long as you like. This width will permit of two rows of plants, and enable flowers to be picked and the plants being attended to without constant treading upon the beds. Soil about the roses should be kept fairly open on the surface, and treading upon the beds should only be permitted on exceptional occasions. If a large piece of ground is to be allotted to the roses, and some sort of design is desired the most practical

and suitable is a small circular centre bed for a large specimen free-flowering, vigorous growing rose—such as “Peace”—with beds radiating all round, the centre bed to be about six feet in diameter, with a four foot path round, and the radiating beds, after the style of the spokes of a wheel, starting at three feet wide, increasing gradually to five feet. For variety, “climbing” roses should be planted at different corners of the garden, at the side of the house, up the verandah, or over substantially built pergolas.

Having the ground in course of preparation, varieties suitable for the climate and purpose required, should be selected with care. There are some varieties so much more to be desired than others, that for those who only wish to commence in a moderate way, with a dozen or two plants, the experience of friends who have been successful with growing roses should be taken advantage of. Never order from a catalogue simply by relying on the description given of the various roses. These descriptions are frequently, especially in the case of the newer varieties, copied from the raiser's description; and, with all due respect to the raisers of some of our most beautiful roses, it must be recorded that such descriptions are more remarkable for the recklessness of choice of superlatives, than for correctness. No mother is so extravagant in eulogy of her first babe as is the rose hybridiser of any result of his labour sufficiently meritorious to be put into commerce.

June and July is the best time for ordering roses from the Southern Provinces, and a catalogue should be obtained from any of the rose growers of repute: Hobson & Co., Kingwilliamstown; Gowies' of Grahamstown; J. W. Matthews of Capetown; A. Paetzold of Tarkastad, are among the best known rose growers, from whom an interesting catalogue can be obtained for the asking, and with the assistance of a rose loving friend, no trouble should be found in making a good selection.

The following are names of two dozen varieties, placed in order of merit, in the writer's opinion, and of different styles of growth, colour, etc. :—

1. Frau Karl Druschki (white).
2. Madam Abel Chatenay (salmon rose).
3. White Madam Cochet (ivory white, outside petals sometimes pink).

4. Madam Cochet (salmon carmine, variable).
5. Dean Hole (silvery carmine, shaded salmon).
6. Madam Jules Gravereaux (yellow to rosy peach, climbing habit).
7. Lady Alice Stanley (outside of petals deep coral rose, inside flesh).
8. Rhea Reid (cherry crimson).
9. Yvonne Vacherot (porcelain white, suffused pink).
10. *Climbing* Caroline Testout (satin rose).
11. Lady Ashtown (pale Rose du Barri, or deep clear pink).
12. Peace (deep cream, will grow into a huge bush).
13. *Climbing* W. G. Grant—syn Belle Siebrecht—(imperial pink).
14. Marechel Niel (bright yellow, climbing).
15. La France (silvery pink, tinged lilac, very fragrant).
16. Antione Revoire (pale cream, deeper centre, light apricot shaded).
17. Mrs. Harold Brocklebank (pale yellow, shaded peach).
18. Gruss an Teplitz (bright scarlet-crimson, very fragrant).
19. W. R. Smith (cream, tinged peach).
20. Kaiserin Augusta Victoria (lemon white).
21. Miss Cynthia Forde (bright rose).
22. Papa Gontier (rosy crimson).
23. Lady Roberts (coppery red to apricot, variable).
24. Cecile Brunner (very small, perfectly shaped light rose, yellowish in centre), one of the "fairy" roses.

The novice cannot go wrong in ordering any of the varieties mentioned. These have all proved good, among the best of a collection of some 200 varieties grown in Umtali. There are, no doubt, many equally good not included, which have not been tried here. Perhaps a list of those which should be avoided would be useful, and in such a list I should include most of the H.P. varieties—such as Her Majesty, Clio, Baroness Rothchild, Helen Keller and (except for exhibitors) Horace Vernet, A. K. Williams, Sir Rowland Hill, Xavier Olibo, Dr. O'Donel Brown, Mrs. Stewart Clark, Mildred Grant and many others. The Wichuriana Hybrids, such as Dorothy Perkins, Hiawatha, and also Crimson Rambler, which are most popular as free flowering rampant climbing cluster roses, in countries where a severe winter is experienced, are most unsatisfactory in Rhodesia and are not recommended. All the twenty-four varieties recommended

are constant bloomers, mostly with large full blooms and good foliage, and, with one or two exceptions, will provide good specimen blooms for exhibiting, as well as furnish the garden with handsome plants, and the house with ample cut flowers nearly all the year round. Those to be avoided will sometimes furnish very handsome flowers for a Show, but they are so few in number and so difficult to obtain really good, that the plants are not worth garden space. For covering an unsightly corner, the single white rose Macartney is well worth growing. It soon covers a large space, has most beautiful foliage, ever green, bright and glazed, and for two months in the year (September and October) is a mass of beautiful large single white flowers, with bright yellow stamens.

The plants, if ordered from the south, should be ordered for delivery not later than the end of July. It is as well to leave the planting until rather late, as they will start into growth almost immediately, and the danger of attacks from white ants and other ground pests is not so great as with dormant plants. But do not delay ordering, as some of the varieties asked for may be out of stock late in the planting season. On arrival of the parcel, the plants should be unpacked at once. If planting cannot at once be attended to, open out and disentangle all the roots carefully, and "lay them in" some light loose soil, giving a watering at once, and see that they are shaded. Do not delay planting longer than absolutely necessary after arrival, and on no account let the roots get the least dry or exposed to dry winds. The plants will usually be sufficiently pruned, stems and roots, but on planting any damaged roots should be cut back to where it is sound, and all withered stems cut out. It is advisable to cut the ends of all the roots slightly with a clean cut. Any suckers coming from the "stock" must also be removed, but the nurseryman will usually have removed these. If, through error in packing, or long delay in delivery, the roots have got quite dry or even the bark of the roses shrivelled, lay the plants flat in the ground and bury them completely, roots and tops, about six inches deep. Give them a good soaking of water, and, unless they have gone too far, in three days the plants will be restored to their original condition.

Taking it for granted that the rosebeds have been properly prepared by trenching or deep digging beforehand, it is only

necessary in planting to take out the soil sufficiently deep to have the roots about four inches below the surface when the operation is complete. If properly "budded," this should well cover the bud, but if it does not the rose must be planted deeper, as it is important that the place where the bud is inserted should be an inch or so below the surface. Carefully spread the roots out horizontally, having the hole wide enough so that it is not necessary to curve the roots, and if they naturally cross each other, put some light soil between, that they may be in layers and as nearly horizontal as possible. Have the soil to come in direct contact with the root, fairly fine and "crumbly," and be particular that no manure comes in actual contact with the roots. Cover the roots with three inches of soil, tread it carefully, fill up to the top and then tread carefully again, but this time quite firmly. When complete, see that there is a saucer-like depression of the soil round the plant to retain water, and while you go on to your next plant, let your assistant give the planted rose a good soaking of water. This is important, but must not be given until the soil, while in a fairly dry condition, has been quite firmly treaded round the plant. It is best to have a companion or a "boy" to assist in the planting, so that the plant can be held straight, while the fine soil is placed round the roots.

The distance between each plant and each row must be governed a good deal by the variety, but provided nothing but roses are in the beds it is surprising to the tyro how close together they may be planted and give satisfaction. As a general guide, I think twice the space allowed in England should be given in this country, the growth being at least twice as vigorous. Except for the very vigorous growers, I recommend $2\frac{1}{2}$ feet between the plants, and 4 feet between the rows, or two rows of plants in a bed 5 feet wide. I will not refer to planting roses grown as "standards," as I think only experienced growers are likely to go in for this form. Taken as a general rule, standards are not satisfactory in this country, although it is interesting to grow some in this style when one has a large collection.

Some gardeners scorn the idea of bothering about the names of the varieties they grow. To them a red rose is a red rose and nothing else, the same with a pink, white or yellow, but those with the love for roses necessary for com-

plete success will always try to keep a record of most of the varieties grown. The best course is to make a plan, showing the beds and the positions of the different varieties named. Labels are a great bother, harbour insects, and, in my opinion, detract from the natural appearance of a garden.

Having the roses planted, the ambition should be to keep them in the most healthy, well nourished condition. In this country one must not be economical with water. Occasions or positions are very rare where there is danger of plants becoming water-logged, most places where roses are likely to be placed being naturally well drained. Do not give a sprinkling every day or so, but a good soaking once or twice a week. Rather use five gallons per rose once a fortnight, than one gallon every day, but better still five gallons once or twice a week. Spraying the foliage with a hose spray is very beneficial, but of course not essential.

White ants are the most dangerous pests rose growers have to contend against in most portions of Rhodesia. They are particularly damaging to newly planted roses and it is essential to take steps to drive them from the plants before they "ring" any of the stems, just above the root, in which case the rose is invariably doomed. I have found the simplest and most effective remedy in Coopers' Liquid Sheep Dip. Two tablespoosfull to a paraffin tin (4 gallons) of water, makes a sufficiently strong liquid to keep ants away, and if about a cup full is placed around the "collar" of each rose a few days after it is planted, it will have no bad effect on the plant. This dose may be repeated a fortnight later, if there are signs of ants working among the plants, but need not be repeated until they are seen to be working near the stems of the roses. Powdered naphthaline, a dessertspoonful mixed with the soil close round the stem is another very good remedy, and retains its virtues a considerable time.

Some varieties will show signs of "mildew" (*Sphaerotheca pannosa*) soon after the first foliage has developed. This must be dealt with on its first appearance, and it is good to at once spray all the roses in the garden with a mixture of carbolic soap and water. One lb. of Calvert's carbolic soft soap to four gallons of water (a paraffin tin full) well sprayed over all foliage will cleanse and stimulate growth, as well as keep down all mildew and another bad pest "green fly."

Orange scale, another and more difficult pest to deal with, will usually only make its appearance when the plants are about a year old. Treat this the same as in the case of citrus trees. Fumigating with cyanide and sulphuric acid is rather beyond most rose growers, although it is the most certain remedy. Failing this, spraying with resin wash, or Jelf's "Scalecide" will keep the pest down.

When the plants are in good growth and showing first signs of producing flower buds, they may, if the ground was not manured before planting, be given weekly doses of liquid manure. This should be made with putting a quantity of kraal manure, or fowl manure, in a large barrel or tank, and filling with water. Only use the thin liquid of this, using it weak. This will increase the size and improve the colour of the blooms, but if the soil is really good, the use of this may well be left until the latter part of the first season.

So far we have only considered starting a rose garden by importing a few plants. This will always be found the most satisfactory method of making a commencement. With such a start, one feels justified in increasing one's collection by begging a few cuttings from a neighbour in exchange for other varieties. On most farms, there are water-courses along the sides of which, if planted in loose sandy soil, rose cuttings will strike with ease, if inserted now. April is the best time, but a fair amount of success will be obtained with June cuttings, and as it is the time for pruning, cuttings are more plentiful. Select well ripened wood, close to old wood, not much more than six inches long. Place the cuttings two-thirds of their length below the surface, the base resting and pressed firmly upon sand, in soil which without being sodden will always be kept moist from the proximity of running water. The cuttings should be exposed to full sunlight, or nearly full sunlight the whole day. They should be allowed to remain in the same position until January rains, when they may be removed to permanent quarters, if great care is taken not to injure the roots.

If left until the following June, they can be transplanted with very little risk.

June and July is the best time for pruning proper, but a good plan is systematic light pruning all the year round by always cutting off all blooms with a fair amount of stem,

before the blooms have quite faded. In this way, roses in Rhodesia will be kept in bloom constantly.

The main pruning should be done in June and July. Only a few brief directions can be given here, but the subject is of much importance in rose culture. As a general principle, the stronger the growth the less the plant should be pruned. The varieties recommended in these notes send up shoots on which flowers are borne the same year. The very weak shoots should at the end of the season be removed altogether, right from the base, the stronger being shortened back one half, or if very strong, only one third, cutting back to a strong "eye" pointing outward, so that when the new growth appears stems will not cross one another. As the plants are rarely quite dormant with us, it is wise to have a little paint or knotting, or even coal-tar, put on to stop "bleeding" after cutting. If this be not done, it will often be noticed that the sap escapes, so as to give the pruned stem the appearance of having water poured over it. This is very weakening to the plant. We cannot here choose a cold day with a suggestion of east wind and sleet, which Rev. J. H. Pemberton recommends as the best time for pruning; few of us would care to do much pruning on such a day. Taking the question all round, moderate pruning is much the best for all growers who want, not only blooms of true character and good form, but in large numbers for cutting. The writer prefers to use secateurs to a knife, as, however sharp the knife, the plant seems to be strained, even though the shoot be firmly held.

Perhaps on some future occasion, with the permission of the Editor, I may send a few further notes on propagation, from budding, cutting, etc., feeding of roses, thinning of shoots, and other operations of interest in the successful culture of the Queen of Flowers. A keen horticulturist in Rhodesia has told me that so little skill or knowledge is required in this, that he has taken to other subjects—dahlias, peas, geraniums, herbs and sweet peas. As the gentleman is a Cambridge Wrangler, far be it from me to argue against his conclusions, and lovers of roses may surely take comfort that their culture is such an easy matter. There are certain essentials to success, however, in this simple matter, and the first essential, the possession of which will lead to the acquirement of all the others, is a firmly established love for the rose.

Notes on Bee Keeping.

ARTICLE III.

By FREDERICK SWORDER.

Considering that so many books on the anatomy and management of bees by well-known practical bee masters are in circulation, all obtainable at reasonable prices, I scarcely deem it necessary in this series of articles to make allusion to foreign bees or their qualities, beyond comparing our own with them.

Chief among these publications, it must be mentioned that a most explanatory work full of well executed photographs and detailed drawings, entitled "South African Bee-Keeping," written by H. L. Attridge, dealing with the practical management of South African bees in moveable comb hives, is the acknowledged Guide Book of the South African Bee-Keepers' Association.

Knowing the author intimately and his capabilities, besides having studied his book, my own observations and experiences closely coincide with his statements.

The markings of the Rhodesian worker very much resemble those of the native bee of the Transvaal and those types of the adjoining Provinces, viz.:—Three anterior segments carrying orange coloured bands across the upper portion of the abdomen, while the remaining segments possess thin bands of delicate white hairs.

In size, our bees are a trifle smaller than those to be found in the Southern Provinces of South Africa. Personally I prefer a large size bee with the above markings, for I have found these to be more docile and superior as all round workers.

Amongst stocks marked as above, bees with distinct grey hairs and without the orange colour markings will often be met with; this cannot easily be accounted for, apparently it is peculiar to South Africans.

In disposition Rhodesian bees are not so docile as Italians, yet if we take the opportunity to subdue them either in the early morning or just before sunset it is found, that with care, they can be safely handled, but it is essential to wear a black net veil.

With a shade temperature often approaching 90 degrees Fahrenheit in our summer months, it is very unwise, in fact, it is dangerous to human beings and live stock to attempt any operation at midday; they, like the Cyprian bees, positively will not have it.

The drones are the male bees, big, burly fellows and very noisy in flight. Their markings are alternate brown and black coarse hair bands, with much lighter shades on the under side of the body.

Speaking generally, the green bee is larger than the worker, possessing comparatively shorter wings, but with a longer body and pale brown long legs, moving about the combs with a stately gait. By a novice who takes notice she could be easily found, being of a distinct copper colour.

As a rule the Rhodesian greens are very prolific, in fact, I have found them too much so, for they will persist in laying abundantly even when there is a shortage of food both inside and outside the hive.

The inferior qualities of our Rhodesian bees are their proneness to excessive swarming, for which, to a great extent, I think our high temperatures are accountable; also the meagre way they work at filling sections with honey. I have yet to prove their capabilities of storing honey in shallow frames

In spite of adopting measures to prevent the first named and most annoying characteristic, many bee-keepers in conjunction with myself, have failed.

Regarding the latter fault, which is a serious item and a very disappointing one when reaping our harvest, I am

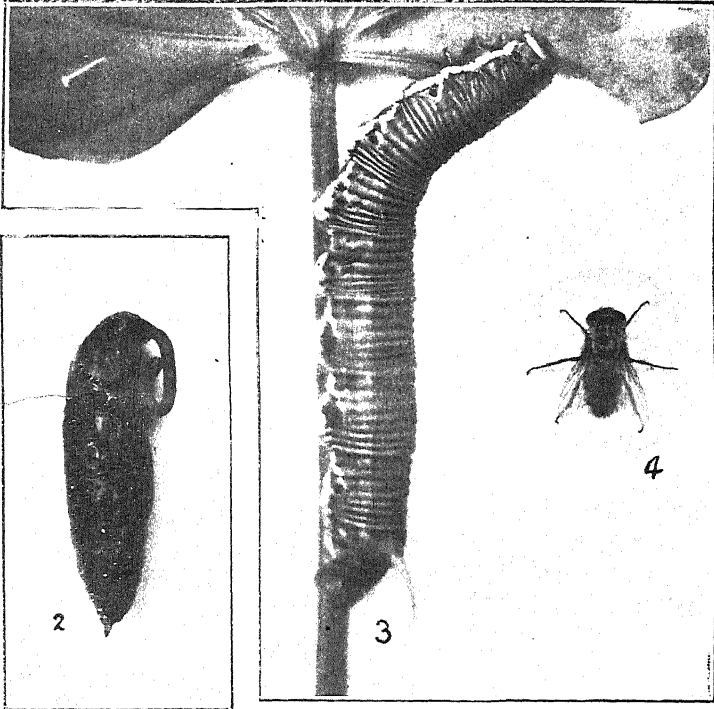
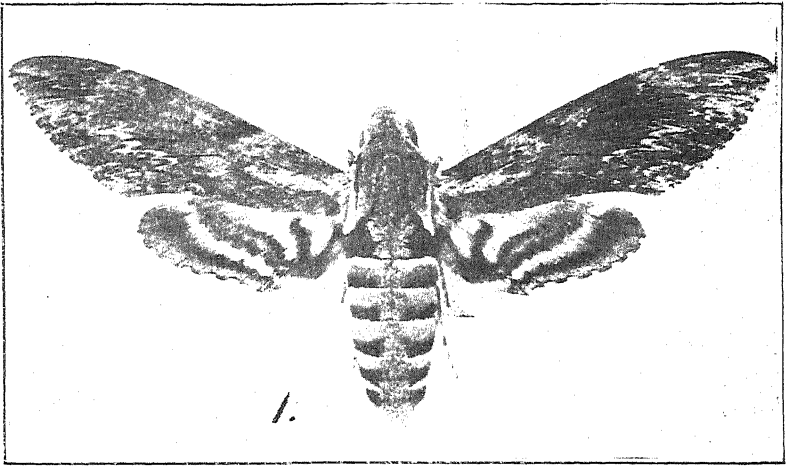
inclined to think that this unworthy trait may, by careful selection, be improved upon and perhaps bred out, but it will take time.

My experience shews that the outstanding feature of our Rhodesian bee is its marvellous capacity for increase or building up, especially in the months of September and October during the period of bush bloom. To quote an instance:—In mid-winter I secured a very small swarm weighing less than one pound, equalling in numbers about 1,500 and measuring less than one pint of bees. This meagre lot, by some bee-keepers would have been beneath their notice. However, with their queen, they were comfortably hived while from other adjoining stocks frames of comb containing honey were given.

This treatment they evidently appreciated, for by September they occupied 10 standard frames. Further room becoming essential a crate of sections was placed above them in October, with a final result of 40 sections and two swarms. A novice might reasonably ask the question: how was this development so quickly accomplished? Where bees are kept in frame hives we can assist them to any desired extent and the above quoted instance affords an object lesson of the desirability of keeping bees on up-to-date lines, all hive parts being interchangeable.

Many years ago it was customary to keep bees in all kinds of things or any box that came handy. This practice is still prevalent and gives most unsatisfactory results, besides causing worry and vexation. Nowadays, instead of groping in the dark, as our forefathers did in using these makeshift and unsuitable domiciles, we can, comparatively speaking, by purchasing a frame hive, start on the top rung of the ladder, for with these convenient appliances, which will be dealt with in future articles, bee-keeping is made very easy.

(To be continued.)



1. Convolvulus Hawk Moth. 2. Chrysalis.
3. The Caterpillar. 4. Tachinidæ.

Notes from the Agricultural Laboratories.

ENTOMOLOGICAL.

The Convolvulus Hawk Moth.—The almost cosmopolitan insect known as the Convolvulus Hawk Moth (*Herse convolvuli*) has this year been very abundant in parts of Mashonaland, and in one instance at least has developed into a pest, causing very serious damage to a field of sweet potatoes.

The adult moth is shown at its natural size in the accompanying plate. As a matter of fact, the size of the insect varies very greatly, not only between the sexes, but also between specimens from the tropics and those from the temperate regions, the latter averaging larger. Several specimens bred out at Salisbury this year are considerably smaller than the specimen figured. The general colour is a grey, but the body is striped at the sides alternately with pink and black. The adult moths, like other members of the family, are fond of hovering about flowers at dusk and sucking the honey with their long tongues. The pupa, or chrysalis, is reddish brown in colour and is contained in an earthen chamber a few inches below the surface of the ground. The handle-like projection at the head-end of the pupa is the sheath of the proboscis or tongue of the adult moth. The full grown larva, or caterpillar, is also shown in life. Caterpillars of this form are known in the United States of America as "hornworms," and two species are very troublesome pests of tobacco. Every caterpillar with this adornment, however, is not an enemy of tobacco, and the species under discussion is not known to feed on that plant. The back of the caterpillar is of a reddish brown colour and there is a row of white lobes along each side. When full grown the length is usually a little over three inches.

The damage of which this insect is sometimes capable will be understood when it is stated that a field of sweet potatoes was completely defoliated in a short space of time. This field consisted of three acres, and at the time of the writer's visit (March 4th), which was just when the last few

caterpillars were preparing to pupate, there was hardly a leaf left on the whole field. The caterpillars had wandered from the sweet potatoes to the bare earth of an orchard near by, in order to enter the ground for their final change. The suddenness of the final destruction of the foliage of the sweet potatoes gave the impresssion that the caterpillars had invaded the crop. This is, however, quite unlikely, the ordinary course of events being that the eggs of the parent moths had been laid on the foliage of the crop and that the young larvae had been feeding unnoticed for some weeks. During the last stage of a caterpillar's life its appetite is very great, and having now reached its maximum size its capacity for damage is considerable, hence the sudden disappearance of the foliage.

It is interesting to note that the farmer's good friend the locust bird, or white stork, put in a somewhat belated appearance towards the end of this outbreak, and some twenty of them remained in the patch for three days until the caterpillars had gone to earth, and no doubt they accounted for a considerable portion of the pest. Besides these birds, however, the pest has a more potent enemy in the shape of a bristly fly belonging to the parasite family, *Tachinidae*. A specimen is figured. During the writer's visit to the scene of this outbreak, upwards of thirty caterpillars were collected and placed in a cage to breed out the adult moths. These caterpillars all entered the earth, but only ten moths emerged, the place of the remainder being taken by over 200 of the Tachinid flies. With little doubt these flies form the chief natural check to the increase of the hawk moth, but from some cause, possibly scarcity of food, their numbers have been reduced so far as to enable the moth's numbers to increase to an injurious extent. The fly, through its great powers of reproduction, was rapidly gaining the upper hand of its host with the brood in question, and another outbreak of caterpillars in the near future is unlikely.

Where it is considered worth while to destroy the caterpillars in order to save the foliage, the application of arsenate of lead at the rate of one pound in twelve gallons of water is recommended. This should only be applied while the caterpillars are small. A knapsack pump is the best machine for the purpose.

EXPLANATION OF PLATE.

- Fig. 1.—Adult moth (*Herse convolvuli*), life size.
 Fig. 2.—Pupa or chrysalis of above, life size.
 Fig. 3.—Larva or caterpillar of above, from life, feeding on sweet potato leaf, life size.
 Fig. 4.—Tachinid fly, parasite which destroys this pest.

CHEMICAL.

The composition of a sample of Rhodesian grown sunflower seed was recently determined with the following results :—

	Per cent.
Water	6'53
Oil (ether extract)	21'49
Protein (total nitrogen X 6'25)	18'48
Carbohydrates	23'09
Fibre	27'89
Ash	2'52
	<hr/>
	100'00
<i>Proportion of husks to kernels.</i>	
Husks	45'22
Kernels	54'78

The sample was grown by Mr. R. C. Frith of Devondale, P.O., Jumbo Mine, and its composition compares very favourably with the sunflower seed produced in Russia, Hungary, India and China, which are the chief sources of this seed for oil yielding purposes. Hungarian seed, which is as a rule richer in oil than the Russian product, consists of 45 to 52 per cent. kernels and 48 to 55 per cent. husks, the kernels containing 36'6 to 53 per cent. of oil.

The sample of Rhodesian seed contains a high proportion of kernels to husks, and the oil content of the kernels was 39'2 per cent.

In the past, attempts to grow the sunflower plant as an oil-seed crop in the United States and India have not met with success from a commercial point of view. At the present time the sunflower is chiefly cultivated in Southern Russia where the "cold drawn" oil is used for culinary purposes and for the manufacture of margarine. The "hot-

expressed" oil is used in soap making, for the manufacture of Russian varnishes and as a burning oil. The cake remaining after the expression of the oil, owing to its easy digestibility and fattening properties, is a very valuable cattle food, in which respect it is comparable with linseed cake. The extent of the sunflower seed and sunflower oil industry in Russia may be gathered from the fact that in the Northern Caucasus from 50,000 to 60,000 tons of sunflower cake were produced in the year 1906. Most of the cake is sent to Denmark and Sweden, and the estimation in which its feeding properties are held will be understood from the fact that the price the cake realised was between that of linseed cake and cotton seed cake. In Russia, sunflower stalks are burnt, and the carbonate of potash, which the ashes yield in considerable quantity, is collected. It is stated that in the year 1905, 2,000 tons of crude carbonate of potash from this source were exported.

Enquiries are now being made with a view to finding a remunerative South African market for the seed, or failing this a means by which the product may be disposed of in Europe.

Extermination of Jackals by Dynamiting.

By W. M. WATT, Agricultural Engineer.

The following has been found an efficacious method for exterminating jackals. The holes may be located by the herd boys, and in order to ascertain that the jackal is at home, a twig may be set up at the mouth of the hole after dark. If this is found down in the morning, it may be presumed that the animal has made a return after the usual nightly prowling. Being now fairly well assured that the animal is inside, it is a simple matter to exterminate him. To do this tie a dynamite cartridge, in which a detonator and about six inches of fuse has been inserted, to a moderately flexible wire rod. Light the fuse in the ordinary way, and push the cartridge down the hole as far as possible. The shock of the explosion will kill anything in the confined space, even if several yards away. One great advantage of this method is that one can get at the litter of young jackals "en masse."

Correspondence.

POULTRY BREEDING.

The Editor, Rhodesia Agricultural Journal.

SIR,—I note in your issue, April, 1912, Vol. 9, No. 4, that your contributor in the fowl article mentions a record in egg laying being 260 for the year.

May I mention that I have Pure White Leghorn fowls from C. H. van Breda's strain and the cock is from a hen with a trap record of 275 eggs for the year. The mother is from a hen with a trap record of 285 eggs for the year. I have ordered again for this incubating season three cocks, at £3 3s. each, from Rondebosch, and am killing off my older cocks and any of his progeny I have not sold out.

There are not many buyers for cockerels above 10s., so it is not very encouraging to import fowls of this class to Rhodesia. I have sold a number at £1, but these only to men who understand what they are doing—any less price I refuse to supply, as the good ones are too good for that figure, "and those with faults help to keep up a pie crust," if you will excuse the expression.

Yours, etc.,

R. W. TWILLEY.

[REPLY.]

Mr. Twilley in his letter of the 23rd April takes exception to a supposed statement of mine, that 260 eggs per hen, per annum is a record output. My words were "If I remember rightly the greatest number recorded is a little over 260 for the year." Now records to be of any value must be officially attested, and the only official attestation of a year's laying I can recollect is one of the American Department of Agriculture, bearing date several years back, and upon which I could not then, and cannot at present, lay my hands, it having been either mislaid or lent to some friend and, as too often

happens, never returned. My statement was therefore a very qualified one, and by no means intended to be exact. Since writing the article in question I have received a letter from a son of the once well-known Andrew Rigby, of Todmorden, Yorkshire, who claims 290 for his late father's Hamburgs. Now I knew "old Andrew" well and he never claimed anything like this himself, though thirty years ago his strain was well known as far as New York.

Enormous annual outputs are from time to time declared, and when they are backed up by the evidences of winning records at laying competitions, they deserve almost complete credence but the *cobiter dicta* are not records, and may not be classed as such. I am now in correspondence with several U.P.C. winners in England, and one or two competition winners in U.S.A., and hope in due course to lay the results of information obtained before the readers of the AGRICULTURAL JOURNAL. In the meantime, however, I must congratulate Mr. Twilley on having introduced such blood to Rhodesia, and shall be glad to hear from him, that he has in Rhodesia reproduced the Rondebosch successes. My own experience, however, is that there is a certain limit, and when a hen has reached that limit her progeny show a slightly retrograde tendency, which must be counteracted by the introduction of very vigorous new blood and extremely careful weeding.

I note that Mr. Twilley considers £3 a high figure to pay for stock. I am glad that I cannot agree with him and should advise him to advertise, when he will find that in Rhodesia there are still a few chosen ones who will pay that figure and more for really first-class stuff. But it must be remembered that he himself must trap-nest and be able to assure his customers that the immediate parents of *his* birds are in the first flight, according to his *own* knowledge. The word of the man on the spot, whom we know and respect is worth ten times that of one who lives 1,500 miles away.

"GALLINULE."

POULTRY KEEPING.

The Editor, Rhodesia Agricultural Journal.

SIR,—I am anticipating going in for poultry—for egg laying and table—I have a splendid position and could raise a large number. I should like to know the best breed to go in for for this country, if it is best to go in just for one breed, or say a cross with two breeds. I have a great fancy for *White Wyandotte* hens with a *Houdan cockerel*, as I think they would answer the two purposes. I would grow all the food for them. What is the best food to grow for them? Are ground yellow mealies better than white? And what is the best food for young chickens?

I might mention I have at present about three pure bred white Leghorns, about one month old, doing well. And could "Gallinule" give me any address where to purchase some good fowls, say one or two good pens, and what is the usual price for a good pen?

Perhaps "Gallinule" would communicate with me on the subject.

I am, etc.,

G. S.

[REPLY.]

The Houdan on Wyandotte cross suggested is not as satisfactory as pure Houdan. If you wish to produce heavy fowls always choose a heavy dam. In my opinion, however, Wyandotte will suit the Rhodesian market quite well as a table fowl, without any admixture if you breed from large mature hens.

The food you should grow will be barley, oats, linseed, sunflower and beans, together with green food such as rape, cabbage, lucerne, lettuce, clover with carrots, mangolds and turnips.

Maize, either white or yellow, is a very unsatisfactory and wasteful food. See my article on foods and feeding in the AGRICULTURAL JOURNAL.

Young chickens should be fed for a few days after hatching on oatmeal moistened with milk, milk-curd or white of egg and boiled greens. Thereafter munga may be given with curdled milk for drink. Greens should not be given with curdled sour milk as they are apt to cause scouring; but if sweet milk is given then greens are necessary. The best grain for food is oats, avoid maize. The best ration is a combination of oats, sunflower seed and barley given separately. Suet can be mixed with scalded bran and makes a very desirable change. Linseed is another wholesome change. Bonemeal, a teaspoonsful per chick per week is recommended.

“GALLINULE.”

POULTRY BREEDING.

We have received the following enquiry from Mr. A. L. Bell, of Uplands, Marandellas:—

The Editor, Rhodesia Agricultural Journal.

SIR,—Can you give me the names of any breeders in Salisbury district of the following fowls:—White Leghorns, Black Minorcas, Rhode Island Reds and Black Hamburgs.

[Will any of our readers kindly furnish the information required.—ED. R.A.J.]

Reviews.

THE STANDARD CYCLOPÆDIA OF MODERN AGRICULTURE.

Keen farmers will welcome the "Standard Cyclopædia of Modern Agriculture," in twelve convenient sized volumes, issued by the Gresham Publishing Company and edited by Professor Sir R. Patrick Wright, containing over 5,000 articles and contributions by the best known authorities who have written on their special subjects. The Dairy Farmer, the Stockbreeder and the Agriculturist alike can now turn up the very latest information in plain and practical language.

Many Rhodesians will appreciate this work for its Anatomical Models and Studies of the Horse, the Cow, the Pig and the Sheep, which, with the numerous veterinary notes, ought often to prove the means of saving valuable animals on farms far removed from professional assistance.

They are essentially farmers' books of reference, touching on almost every subject of up-to-date progressive farming, and provide fresh interests in descriptions of how the Australian, Canadian and other Colonies and foreign countries have developed and have gradually overcome their difficulties.

The analysis and testing of milk and the chemistry and statistics of butter and cheese-making comprise the recommendations of to-day's leading dairy experts, and the most up-to-date appliances are explained.

There are very good photographs of typical champion specimens of every pure breed of Horse, Cattle, Pig, Donkey, Goat, Sheep, Dog, Poultry, etc., with a full history of each breed, its advantages, special points, and its success or unsuitability in various parts of the world.

Some of the most interesting articles which may be mentioned as especially suitable to Rhodesian farmers are :—

Varieties of artificial manures, bacon curing, bacteriology, bee-keeping, special advantages of bone meal and bone manure, and methods of using farm-yard manure to the best possible advantage; haymaking, irrigation, judging of live-stock by score cards, litter for bedding of animals and collection of liquid manure, "mendelism," nitrogen-fixation in soils, parturition, with excellent plates of foal and lamb, refrigeration, and poultry.

The general properties of soils are most carefully outlined with their bearing on, and relationship to, fertility, and the actions of living organisms and inorganic materials are explained.

There are also illustrations and descriptions of many plants and insects, as well as of every instrument, implement and device, and farmers would do well to keep such a work of reference ever ready to hand.

From our standpoint the disadvantage of such a work is that it is not written especially for Rhodesian conditions, but if intelligent allowance is made for this deficiency, a work of this nature can yet be of much service and of much instructional value.

TICKS IN RELATION TO STOCK.

We recommend to our readers a pamphlet entitled "Ticks in Relation to Diseases of Stock," issued by Messrs. Cooper & Nephews, the well-known manufacturers of cattle and sheep dips. The work is intended to place before stock-owners a popular description of the ticks which attack farm stock and of the diseases they transmit, with some account of the various methods proposed for dealing with the question.

The section dealing with ticks and tick diseases describes concisely the anatomy and life history of the tick, the methods whereby it transmits disease and the diseases transmitted to our domestic animals. These are African Coast fever, redwater, gall-sickness, heartwater, bilary fever of horses, and bilary fever of dogs. The various methods practiced for the destruction of ticks are described; these are,

of course, of great interest, and we would strongly advise our cattle owners to consider carefully that one, so far best—most satisfactory—dipping.

Naturally some attention is devoted to the various fluids used for the destruction of ticks and the superiority of Coopers' over all others. Whilst we have no wish to enter into this discussion, it may be said that Cooper's dip is that used by the Veterinary Department with satisfactory results.

The work is neatly got up, and includes some excellent illustrations and is distributed free to applicants.

Australian Dry Farming.

What "dry farming" has done for the Australian wheat-grower in recent years was well illustrated at a farmers' conference in South Australia recently by the State Minister of Agriculture, who addressed the conference. The Minister himself is an owner of wheatlands in what is called the upper northern area of the State. "Dry farming" means the scientific ploughing of land so as to conserve in a dry year what rain the land does receive—that is, by maintaining proper contact between surface and subsoil. The Minister said he had been keeping rainfall records for years on his farms, and last year was one of the driest, especially during the growing period, which they had had for some time. Yet on only a $3\frac{1}{2}$ inch rainfall he had reaped an 8 bushel harvest. In the old years with anything less than a 10 inch rainfall, he had never reaped anything. Fancy 8 bushels on a rainfall of $3\frac{1}{2}$ inches! It demonstrated beyond a shadow of a doubt that something could be done by means of cultivation to assist nature in the less favourable years. Farmers, he said, had not tackled the question yet with anything like sufficient energy and thoroughness. The lesson is being slowly learned in other parts of the interior of Australia beyond what used to be deemed the safe rainfall belt. Scientific farming is making all the difference in these districts between barren emptiness and smiling fertility.

Market Reports.

SALISBURY.

The market is well supplied with produce of all kinds, excepting beans and monkey nuts. These are practically unobtainable in Rhodesia at the present time and the new crop being very poor, high prices are expected during the next 12 months. The season's mealies are now coming in and a reduction in prices may be expected during the next month. Little effort is being made as yet, locally, to supply the market with dairy produce and but a very small quantity of butter is being sent in, while eggs are very scarce. Fowls are on offer fairly freely, but good birds can always command good prices. There is no demand for donkeys, but mules are saleable. Breeding stock is difficult to obtain locally, farmers marking time and increasing their herds.

BULAWAYO.

There is not much to report here, but supplies are fairly plentiful. Vegetables, however, are scarce, though potatoes are rather more plentiful. No new grain is yet offering, all supplies continuing to come from the south.

HOME MARKET.

Latest mail advices from Home are to the effect that prices are generally lower all round. River Plate maize, new crop, is offering freely and values are as follows:—

April—May shipment	...	...	...	26/6 to 26/9.
May—June	„	...	...	25/3 to 25/4½.
June—July and July—August shipment	...	...	...	24/6 to 24/9.
All per 480 lbs., c.i.f., to the United Kingdom.				

Re-sellers of River Plate oats are also offering freely at 17/6 per 304 lbs., April—May and May—June shipment to London. Values of English wheat are 45/- to 42/- per 504 lbs., according to quality.

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Barley, per 150 lbs. ...	9/3 11/6	(163 lbs.) 8/6 10/6	—	30/0 31/0
Beans, per 203 lbs. ...	24/0 30/0	—	per tray 1/6 4/0	—
Beans, Sugar ...	—	24/6 32/6	—	—
Beans, kafir, per 203 lbs. ...	—	20/0 24/0	—	30/0 35/0
Boer Meal, unsifted, per 200 lbs. ...	sif'd 17/6 19/6	19/6 20/0	40/0 41/0	40/0 42/6
Bran, per 100 lbs. ...	6/0 6/9	—	14/0 14/6	15/0 16/0
Flour ...	—	—	—	—
Flour, Colonial 100 lbs. ...	—	14/0 14/6	22/0 22/6	20/0 24/0
Forage, 100 lbs. ...	3/6 5/9	5/0 5/3	10/6 12/0	10/0
„ Colonial Oat ...	—	—	—	10/0 11/0
Hay, per ba'e ...	6d. 1/0	—	per ton. 60/0 70/0	per ton. 35/0 40/0
Kafir Corn, White, per 200 lbs. ...	11/0 12/0	12/0 15/0	—	—
Manna, per 100 lbs. ...	1/6 3/0	—	—	6/0 7/0
Mealies, S.A., White per 200 lbs. ...	8/6 10/0	11/0	18/6 19/6	15/0 16/0
Mealies, S.A., Yellow, per 200 lbs. ...	9/0 9/6	11/0 12/0	17/6 18/6	—
Mealie Meal, White, per 200 lbs. ...	17/0 23/0	(183 lbs.) 11/6 13/0	—	15/6 16/0
Manga, per 200 lbs. ...	—	—	—	20/0
Monkey Nuts, per bag ...	—	—	17/6 18/6	—
Oats, per 150 lbs. ...	6/9 7/6	10/6 11/0	20/0 20/6	21/6 22/6
Onions, per 120 lbs. ...	12/6 13/0	6/0 12/6	22/0 23/0	25/0 27/0
Peas, per 200 lbs. ...	16/0 19/6	—	—	—
Potatoes, per 150 lbs. ...	4/6 9/6	—	17/6 19/6	25/0 27/6
„ New ...	11/0 13/0	9/6 19/0	—	—
Rapoko ...	—	—	—	25/0
Rye, per 200 lbs. ...	9/11 11/6	—	per bag	25/0 27/6
Salt, per 200 lbs. ...	—	—	10/6 11/0	14/0 15/6
Tobacco, good, per lb ...	—	—	—	—
„ inferior, per lb ...	—	—	—	—
Wheat, per 203 lbs. ...	13/0 17/6	16/6 18/6	—	30/0
Butter, per lb. ...	10½d. 1/4	11d. 1/2	1/3 1/6	1/6 2/0
Butter, second quality ...	—	—	—	—
Eggs, per doz. ...	1/3 1/8	1/5 2/0	2/6 4/0	4/0 4/6
Ducks, each ...	1/9 2/6	2/6	—	3/6 5/0
Fowls, each ...	1/0 2/6	10d. 2/6	1/1 2/0	3/6 8/6
Geese, each ...	2/10 3/6	—	—	11/0 14/0
Turkeys, each ...	4/6 15/0	—	—	11/0 18/0

LIVESTOCK.

Article.	Johannesb'rg.	Kimberley.	Bulawayo.	Salisbury.
Horses ...	£4/10 £27	£10 £25	£20 £35	£20 £35
Mules ...	£7	£18 £25	£31 £37/10	£20 £35
Donkeys, geldings ...	—	£5 £7	£7 £8/0	£6/10 £7/10
„ mares ...	—	£6 £7/10	£8/10 £10/10	£8 £9
Cows, Dairy ...	—	—	£25 £35	£25 £32
Cows, Native ...	£4/10 £8/2/6	—	—	£9/10 £10
Oxen, Trained ...	£7 £12/10	£7/10 £8/10	100 lbs.	£10 £12/10
Oxen, Slaughter ...	—	—	35/0 40/0	40/0 42/6
Oxen, Ordinary ...	—	£8 £9/10	£8/10 £11/10	£9 £10/10
Oxen, good ...	—	£10 £13/10	—	£12/10 £13
Oxen, medium ...	—	—	—	—
Calves, Slaughter ...	£2/10 £3/7/6	—	—	£3
Heifers, Colonial ...	—	—	£8 £17/10	£10/10 £11/10
Heifers, Native ...	—	—	—	£7/10 £8/10
Sheep, ...	9/3 18/9	13/0 15/0	22/0 25/6	20/0 22/6
Pigs, clean, per lb. ...	—	3d. 3½d.	—	4d. 4½d.

Veterinary Report, March, 1912.

SALISBURY.

AFRICAN COAST FEVER.—Fresh outbreak.

On March 7th a two-year-old heifer in a herd grazing on the eastern section of the Commonage died from Coast fever. Fortunately all cattle on the Commonage have been dipped for more than 18 months now and ticks are comparatively scarce, and it is hoped that by three day dipping, which was at once resorted to, the spread of infection will be stayed.

It will be remembered that an outbreak occurred in March, 1910, on the Brickfields section of the Commonage. All the cattle in the vicinity were disposed of by slaughter or removal to clean veld, and a large area around the actual seat of infection was fenced, since when no cattle have been allowed on it except some test cattle in December last; these remain healthy.

It is impossible to connect the two outbreaks as an interval of at least 22 months occurred between the last case of disease in 1910 and the present case, and at least 20 months had elapsed since the infected area was fenced and denuded of cattle. There has been no serious mortality of calves or older animals in any of the Commonage herds, indeed every death for the last two years has been satisfactorily accounted for. The other infected centres in the district have been free from disease for over 12 months, except in one case where Koch's bodies were demonstrated in a calf which recovered after a few days illness. These centres are fenced and no cattle have been allowed to leave them for over two years.

I am unable, therefore, to account for the origin of infection in this outbreak, but it may or may not be a coincidence that the herd affected contains at least one animal well known to be salted.

ANAPLASMOSIS.—Three cases reported.

EPHEMERAL FEVER (three days sickness).—This disease continued to spread during the month and most farms in the district were affected. Very few deaths were reported, but they included unfortunately an imported Sussex bull, belonging to Mr. Clayton, and an imported Friesland bull, belonging to Mr. McLaurin.

MALLEIN TEST.—Three horses were tested on entry and found healthy.

SCAB.—One outbreak amongst sheep reported.

BULAWAYO.

AFRICAN COAST FEVER.—There were no fresh outbreaks during the month, and the course of events at the infected centres was as follows:—

Bulawayo Commonage.—The number of deaths was 12, as against 28 during February. The total mortality to the end of the month is 121.

Arrangements are being made for the removal of the cattle remaining on the infected veld to a clean portion of the Commonage through temperature camps.

Induba Farm, Bembesi.—Two deaths early in the month, bringing the total up to 24.

Farm Inyorka.—No deaths.

North Paddock, Mzingwani.—Cattle remain healthy and will shortly be moved to the Mzingwani Native Reserve.

Mtabaende, Spitzkop and West Paddock, Mzingwani.—Nothing to report.

Farm Collaton.—25 animals were destroyed, bringing the total mortality to 29.

The farm has been fenced and the dipping tank is nearing completion.

Woollendale.—2 animals destroyed on showing rise of temperature.

MALLEIN TEST.—The following animals were tested during the month and found healthy :—

Horses	...	...	8
Mules	...	...	70
Donkeys	...	...	103

This includes 4 horses and 1 mule tested at Plumtree.

HORSESICKNESS INOCULATION.—Six mules inoculated, no deaths.

STOCK IMPORTED.—

Heifers	...	...	75
Bulls	...	...	3
Sheep and goats	...	...	5,962
Pigs	...	...	65

TRYPANOSOMIASIS.—An outbreak of this disease occurred amongst some native cattle in Sebungwe District, and at date of inspection 20 head had succumbed.

UMTALI.

AFRICAN COAST FEVER.—Existing outbreaks.

One case occurred amongst Messrs. Barry and English's herd on Umtali Commonage. The subject, a three weeks' old calf, was born in a kraal adjoining the dairy and within two hours of birth was placed in a calf house which had not been used for over 18 months. The calf left this shed only for suckling (in the milking shed adjoining) and dipping.

EPHEMERAL FEVER (three days sickness).—A few cases reported.

MORTALITY IN CATTLE FROM VARIOUS CAUSES.—During the month several deaths, chiefly in calves, occurred in the district. Post mortem and microscopic examinations failed to discover any evidence of specific disease except in two cases where anaplasmosis was evident.

IMPORTATIONS.—31 head of slaughter cattle from Macequece.

MAKONI AND INYANGA.

AFRICAN COAST FEVER.—No fresh outbreaks and no cases amongst the herds moved from infected veld.

MAZOE, MACHEKE, MARANDELLAS AND HARTLEY.

EPHEMERAL FEVER (Stiffsickness) reported from these districts.

PLUMTREE.

Seventy-six head of cattle illegally introduced from the Tati Concessions were traced to the farm Redhill and destroyed.

In all other districts stock reported free from disease.

Veterinary Report, April, 1912.

SALISBURY.

AFRICAN COAST FEVER.—Fresh outbreaks. None.

Existing outbreaks. No cases of disease occurred on the Commonage, which is the only centre in the district now actively infected.

ANAPLASMOSIS.—Two cases reported.

MALLEIN TEST.—Five horses tested on entry and found healthy.

BULAWAYO.

AFRICAN COAST FEVER.—Fresh outbreaks. None.

EXISTING OUTBREAKS.

Bulawayo Commonage.—There was a decided improvement during the month; only one case occurred as against 12 in March, and 28 in February. The total mortality to the end of the month is 122 head.

Early in the month 63 head of cattle were moved from the infected section to a clean portion of the Commonage, and temperatured daily for three weeks. Two animals were returned to the infected veld as showing a rise of temperature, one of which subsequently developed Coast fever.

Collaton and Irene.—During the month 34 animals were destroyed, bringing the total mortality up to 63 to the end of the month. All the cattle, about 1,000 head, are being temperatured daily. The dipping tank will shortly be completed, when three day dipping will be practised.

The position at this centre is very difficult; all the clean herds have to drink on the infected ground, and there is no available veld to which the clean herds could be moved, or

which could be used for eliminating the disease from the infected herds. The only method, therefore, short of destruction of the whole lot, of dealing with this outbreak, is to temperature all animals daily, destroying those which show a rise of temperature, and dip every third day.

No cases of sickness occurred at any of the other centres.

MALLEIN TEST.—The following imported animals were tested at Bulawayo, Plumtree and Gwanda:—

Horses	...	...	8
Mules	...	...	198
Donkeys	...	...	64

One horse gave a suspicious re-action and was detained for a further test.

HORSESICKNESS INOCULATION.—49 mules inoculated, no deaths.

CATTLE IMPORTED.—

Bulls	...	...	15
Heifers	...	...	384
Sheep and goats	...	...	5,051

UMTALI.

AFRICAN COAST FEVER.—

Fresh outbreaks	...	None
Existing outbreaks	...	No fresh cases

IMPORTATIONS.—Twelve head of slaughter cattle from Macequece.

GWELO.

Eight bulls imported from England by the Central Estates Company were tested with tuberculin, with the result that only three appeared to be free from tuberculosis. Three gave most marked re-actions and were destroyed, and two which gave doubtful reactions will be tested again.

MAKONI AND INYANGA.

No fresh outbreaks.

All the cattle previously removed from infected veld remain healthy.

With the exception of a few cases of Ephemeral Fever (Three days Sickness), in the Inyanga, Melsetter, Selukwe and Enkeldoorn districts, all other districts are reported free from contagious disease.

GENERAL.

HORSE-SICKNESS. — The mortality during the present season is the smallest ever recorded. So far only a few deaths have been reported.

VELD AND WATER.—Owing to the short rainfall, especially in the southern part of Matabeleland, the supply of grass and water is very limited. Indeed, in many places, the conditions are practically those which generally exist during the months of September and October. Several farmers have already been granted permission to move their stock for water.

J. M. SINCLAIR,
Chief Veterinary Surgeon.

Agricultural Reports

MARCH AND APRIL.

Reports to hand from the outlying districts show that the absence of rain is causing a general deficiency of crops throughout Mashonaland. Good harvests, yielding a surplus over local requirements will be reaped in the M'Rewas and Makoni districts, but elsewhere there is a shortage. A half crop, or less, is anticipated in the Goromonzi and Mazoe districts, but failures are reported in parts of Charter, Ndanga, Melsetter, Umtali and Darwin. The outlook for the winter in these districts is serious. Although the continued drought will result in short crops and scanty pasture, there is no likelihood of a grave want throughout Mashonaland, the districts of M'Rewas and Makoni, already referred to, being able to supply the deficit. Pearl millet (nyouti, munya) has withstood the drought, and yielded a crop where rapoko (rukweza) is a total failure. In some parts the natives are already reduced to eating grass seeds, roots, baobab, and other wild fruits. This scarcity of food has led natives to go out in search of work, although many still remain in idleness at the kraals in spite of the dwindling supplies.

In the Mazoe district stock is reported to be in good condition and health, except that ephemeral fever is still lingering in the district. With regard to the controversy as to the danger to consumers of the meat of cattle dipped in arsenical dips, it is of interest to know that no ill effects have been experienced by a number of natives in this district who ate the flesh of some animals which died from arsenical poisoning.

Throughout Mazoe European crops are doubtful; good yields are reported here and there, but potatoes, oats and wheat are backward and disappointing, the usually wet vleis being much drier this season. Tobacco is somewhat deficient in

weight, although the colour is good. Baboons and wild pig have done more than usual damage, owing to lack of labour to drive them away at the critical time. Wherever in the granite area good rains have fallen, the native rapoko crop appears fair, but it is a failure elsewhere. If rains do not fall during the winter there will be a serious shortage of water.

Lions are reported very troublesome along the Sabi river, and the same is the case on the Umvukwe cattle ranches, five of these depredators having been shot or poisoned in the latter neighbourhood during the past few weeks.

The outlook in Matabeleland is serious. At the commencement of the dry season streams regarded as perennial were dry. According to native traditions, there has been no such scarcity of water since about the year 1860. Throughout the Matopas, the Mopani veld, Tuli-Manzanyama, Gwanda, Chibi, Mangwe and Sebungwe, the situation is grave as regards crops, and loss of stock from poverty and thirst is commencing. On the other hand, stock is in good condition and crops satisfactory in the districts of Bubi, Gwelo, Selukwe and Nyamandhlovu. There is no occasion for alarm anywhere, for shortages can be met out of native stocks.

Weather Bureau.

TEMPERATURES.

STATION.	MARCH.		APRIL.	
	Max.	Min.	Max.	Min.
MASHONALAND—				
Chicongas Location	85.3	57.6	85.5	58.2
Chishawasha	81.1	53.2	80.7	50.2
Hallingbury Farm (Hartley)	84.0	55.4	85.2	55.6
Melsetter	68.9	—	73.2	—
Salisbury Agricultural Laboratory	78.6	52.8	79.2	54.4
„ Gaol	76.5	53.6	80.5	54.2
“Summerfield” (Umtali)	85.3	53.8	86.8	52.6
MATABELELAND—				
Bulawayo Observatory	79.7	57.7	81.6	56.3
Empandeni	84.4	58.4	88.1	57.6
Plumtree	82.3	58.6	82.6	58.9
Rhodes Matopo Park	82.2	53.6	82.4	55.0

RAINFALL.

STATION.	Mar.	April
MASHONALAND—		
Ardgowan (Hartley)	0.94	0.75
Banket Junction	0.63	2.50
Charter (Meikle's Farm)	4.56	—
Charter Range	1.16	0.41
Chicongas Location	1.26	0.26
Chilimanzi	—	—
Chishawasha	0.84	1.86
Darwendale	1.41	0.41
Darwin	0.39	—
Driefontein (Umvuma)	1.49	1.39
“Eagle's Nest” (Makoni)	0.86	0.98
Eldorado Railway Station	1.03	—
Enkeldoorn	0.43	0.80
Gadzema (Giant Mine)	2.50	0.14
Gatooma	—	—

RAINFALL—continued.

STATION.				Mar.	April
MASHONALAND—(Continued)					
Gatooma Railway Station	...	...	...	2'45	1'28
Goromonzi	...	...	...	1'07	2'34
"Grootfontein" (Umvuma)	...	...	...	1'55	0'91
Gutu	...	...	...	2'25	0'42
"Hallingbury" (Hartley)	...	...	...	2'88	0'41
Hartley Railway Station	...	...	...	1'25	0'60
Helvetia (Melsetter)	...	...	...	3'09	—
Inyanga (York Farm)	...	...	...	1'61	0'56
Inyanga (Police Camp)	...	...	...	0'81	—
Kanyamba	...	...	...	—	—
Lone Cow Estate (Lomagundi)	...	...	...	1'10	3'19
Lowdale	...	...	...	0'54	2'11
Macheke Railway Station	...	...	...	1'84	1'40
Makwiro	...	...	...	1'63	0'72
Marah Ranche	...	...	...	—	—
Marandellas	...	Railway Station	...	2'19	2'77
		Land Settlement Farm	...	0'87	—
		Good Hope	...	1'01	2'62
Marthdale (Victoria)	...	...	...	1'68	0'25
Mazoe	...	...	...	0'73	1'73
"Meadows" (Salisbury District)	...	...	...	1'48	1'18
Melsetter	...	...	...	2'12	1'50
Monte Cassino (Makoni District)	...	...	...	—	1'17
Morgenster	...	...	...	3'56	0'47
Mrewa	...	...	...	0'81	—
M'toko	...	...	...	1'14	0'17
Mount Selinda	...	...	...	—	1'09
Pamushama	...	...	...	1'79	0'57
Premier Estate	...	...	...	1'19	0'17
Police Station (Rusapi)	...	...	...	—	—
Rusapi Railway Station	...	...	...	1'80	1'53
Westridge (Salisbury District)	...	...	...	—	—
Salisbury	...	Gaol	...	1'73	1'56
		Laboratory	...	0'71	1'76
		Public Gardens	...	0'98	1'75
		Railway Station	...	2'12	1'63
Shamva	...	Stapleford	...	—	—
		...	...	1'51	0'55
Sinoia	...	...	...	1'69	—
Sleamish (Mazoe District)	...	...	...	1'60	—
"Stoneygate" (Hartley District)	...	...	...	2'37	1'42
"Summerfield" (Umtali District)	...	...	...	4'06	0'36
Sunnyside (Mazoe)	...	...	...	1'54	—
Teign	...	...	...	3'03	0'55
"Tom's Hope" (N. Melsetter)	...	...	...	1'16	1'21
"Tweedjan" (Marandellas)	...	...	...	—	0'78
Umtali	...	...	...	—	0'33
Umtali Railway Station	...	...	...	1'34	0'24
Umtali (Mutambara Mission)	...	...	...	0'32	—
Umvuma Railway Station	...	...	...	1'90	0'75
"Utopia," Umtali District	...	...	...	1'49	0'45
"Vermont," Melsetter District	...	...	...	2'70	0'78
Victoria	...	...	...	—	—
Gokomere (Victoria District)	...	...	...	1'98	0'42

RAINFALL—*continued.*

STATION.			Mar.	April
MATABELELAND—				
Balla Balla Railway Station	...	...	1'33	0'64
Battlefields Railway Station	...	...	1'03	1'00
Bembezi Railway Station	...	...	1'92	0'39
Bulawayo	...	Government House	—	—
	...	Observatory	3'22	0'37
	...	Raylton	0'50	0'45
Empandeni	...	...	0'43	0'20
Edwaleni	...	...	—	—
Essexvale	...	...	1'69	0'01
Fig Tree	...	...	0'87	0'17
Filabusi	...	...	0'84	—
Globe and Phoenix	...	...	0'39	0'67
Gwaai Railway Station	...	...	0'33	0'68
Gwanda Railway Station	...	...	—	—
Gwelo	...	Railway Station	0'50	1'79
	...	Lower	0'42	1'69
Heaney Railway Station	...	...	0'97	0'62
Imbeza Kraal	...	...	0'80	0'72
Insiza Railway Station	...	...	1'20	1'81
Inyati	...	...	0'19	—
Malindi	...	...	2'88	2'28
Mangwe Pass	...	...	—	—
Marula	...	...	0'83	1'80
Matopo Mission	...	...	0'38	0'05
Matopo Park	...	...	0'51	0'44
Maxim Hill	...	...	2'54	0'69
Mazunga	...	...	0'21	0'17
Melinakanda Junction	...	...	1'06	—
Mtshabzi Mission	...	...	—	—
Nyamandhlovu Railway Station	...	...	0'56	1'30
Plumtree	...	...	1'47	0'18
Que Que	...	...	—	—
Rhodesdale (Central Farm)	...	...	—	—
Rixon	...	...	1'20	0'61
Ringstead (Essexvale)	...	...	2'34	—
Selukwe Railway Station	...	...	2'99	0'61
"Shawlands" (Gwelo)	...	...	1'00	0'73
Solusi	...	...	2'32	0'71
Sebungwe	...	...	—	—
Syringa	...	...	—	—
Tegwani	...	...	0'50	0'20
Tuli	...	...	0'24	0'70
Tamba Farm (Belingwe)	...	...	0'34	—
Umgusa (Eubi)	...	...	—	—
Victoria Falls	...	Railway Station	1'39	1'10
	...	Police Camp	1'40	1'12
	...	Hospital	1'62	0'55
Wankie	...	Railway Station	0'91	0'28
West Nicholson Railway Station	...	...	0'27	0'01

Dates of Meetings of Farmers' Associations, Southern Rhodesia. (SUBJECT TO ALTERATION).

Name of Association.	Place of Meeting.	Secretary.	1912.					
			June	July	Aug.	Sept.	Oct.	Nov.
Charter M'gezi	...	W. Krienke	...	15	...	25	...	27
*Central	...	R. Aldons	29	27	31	28	26	30
Chipinga	...	L. Dobell	...	25	...	10	31	28
Enterprise	...	Jas. Watson	11	9	13	10	8	12
Figure Branch, R. L. & F. A.	...	A. Curtis	...	...	10	...	...	13
Gatooma	...	Lionel Gobell	8	13	10	14	12	9
Gazaland	...	H. F. Savory	...	4	...	...	3	14
Hartley	...	H. Barnes Pope	8	6	10	7	5	9
Headlands	...	W. B. Harris	...	27	...	28	...	30
Insiza	...	G. P. Watermeyer	...	...	...	...	...	...
Kimberley Reefs	...	G. P. Smit	9	14	11	8	13	10
Lalapanzi	...	J. G. Roberts	15	20	17	21	19	16
Lomagundi	...	H. H. Kidson	...	20	...	21	...	16
Macheke	...	A. B. Fraser	...	6	...	7	...	2
Makwiro	...	P. B. Shashall	15	20	17	21	19	16
Manica	...	C. M. Wright	1	6	3	2	7	4
Marandellas	...	W. E. Dowsett	1	6	3	17	5	2
Marula	...	M. W. Ingram	15	20	17	21	19	16
Mashonaland	...	W. H. Williamson	...	6	3	7	5	2
Matopo Branch, R. L. & F. A.	...	W. E. Dowsett	2	...	...	1	...	1
Mamba Branch, R. L. & F. A.	...	M. W. Ingram	15	20	17	21	19	16
Mazoe	...	V. W. Fynn	2	...	...	1	...	1
Melsetter (North)	...	N. N. Rutherford	1	...	...	7	...	7
Midlands	...	M. L. Price	8	13	10	14	12	9
Northern Umfali	...	A. Tulloch	6	4	1	5	3	7
Plumtree	...	Chas. Atkinson	14	...	9	...	11	...
Rhod. Landowners & Farmers	...	Harry Hopkins	28	26	30	27	25	29
Somabula and Shangani Flats	...	S. Annandale	1	6	3	7	5	2
Umvumvuma	...	N. N. Rutherford	...	...	...	...	...	7
Victoria	...	J. Rutherford	19	17	21	18	16	20

* Head Quarters at Umvuma. One Meeting in each quarter held at Enkeldoorn.

Departmental Notices.

LECTURES FOR FARMERS.

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable, lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner but the suggestion of other themes is invited.

Agriculture.—Maize growing; Maize selection and maintenance of the breeding plot; Points of maize and maize judging, with demonstrations; Utilisation of granite vlei soils; Ground nut culture; Rotation crops for home use and for sale; Veld improvement by winter grasses; Production of foodstuffs for the mines; Ensilage; Fungoid diseases of maize and wheat; Wheat, oats, and lucerne under irrigation; The prospects of cotton culture in Southern Rhodesia.

Veterinary Hygiene.—Detection and prevention of disease
The care of livestock.

Livestock.—Judging of cattle according to breeds, and for beef, milk, and draught; feeding and kraaling of live stock; general principles of cattle breeding; management of imported stock; grading up of native or local stock with pure bred bulls.

Dairying.—Home butter making; building and equipment of a farm dairy; handling and marketing of milk; packing and marketing of butter; construction of cow houses.

Swine Husbandry.—Breeding and feeding of swine; some suggestions for the production of first class bacon pigs; construction of piggeries at moderate cost.

Chemistry.—The principles of soil fertility; the principles of manuring; the value of lime in agriculture; chemistry of milk and its products (accompanied by demonstrations in milk testing).

Entomology.—Economic entomology on the farm; the role of insects and their allies in the transmission of disease; scale insects and fruit trees and methods for their control; insect pests and maize; enemies of the potato, insect and fungus; the value and objects of plant import and nursery regulations.

Irrigation.—Methods of applying water to land for irrigation; the measurement of water in connection with irrigation; canal irrigation; storage reservoirs; hints on the selection of sites and on the design of earthen and other dams; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

PROPOSED COURSE OF INSTRUCTION IN AGRICULTURE.

SALISBURY, MONDAY 5th TO SATURDAY, 24th AUGUST, 1912

Subject to a sufficient number intimating their desire to attend, lectures on the following subjects have been arranged to be delivered at the Agricultural and Veterinary Laboratories, Salisbury.

Livestock Industry.—Eric A. Nobbs, Ph.D., B.Sc., etc., Director of Agriculture; Reginald C. Simmons, Chief of the Animal Industries Branch.

Veterinary Hygiene.—J. M. Sinclair, M.R.C.V.S., Chief Veterinary Surgeon; L. E. W. Bevan, M.R.C.V.S., Government Veterinary Bacteriologist.

Arable Farming.—H. Godfrey Mundy, F.L.S., Agriculturist and Botanist; J. A. T. Walters, B.A., Assistant Agriculturist; J. W. Lewis, Tobacco Expert.

Agricultural Chemistry.—G. N. Blackshaw, B.Sc., F.C.S., Chemist.

Entomology.—Rupert W. Jack, F.E.S., Entomologist.

Agricultural Engineering.—W. M. Watt, Irrigation Engineer.

No fees will be charged. To those who attend all the lectures the cost of their railway tickets (2nd class, return) will be refunded. For those who desire it examinations will be held at the conclusion of the course, attendance at which is optional. Certificates will be given to those who attain a certain standard of marks, and a medal will be awarded to the student obtaining highest place over all subjects, and prizes to those highest in each individual subject.

SYLLABUS OF STUDIES.

Livestock Industry.—Cattle: Principles of breeding, management and judging; characteristics of breeds.

Sheep: Breeds; prospects and management.

Dairying: Handling and marketing of milk; butter making; packing and marketing of dairy produce; construction and equipment of dairies and cow houses; methods of co-operation applicable to the dairy industry.

Pigs: Breeding and feeding of swine; construction of piggeries; bacon factories.

Poultry: Management.

State-aid to the livestock industry.

Veterinary Hygiene.—The care of livestock, with special reference to the detection and prevention of disease; regulations governing outbreak of diseases, ox-transport, movement and importation of livestock.

Arable Farming.—Rhodesian farm crops, their culture and economic uses; farm management, rotations, manuring, veld improvement, ensilage; forestry, farm plantations, indigenous timbers of economic value; the culture and curing of tobacco.

Agricultural Chemistry.—Principles of soil fertility; principles of manuring; chemistry of farm foods with special reference to Rhodesian farm products; chemistry of dips, disinfectants and insecticides; chemistry of milk and its products.

Economic Entomology.—Insect pests of our principal crops and fruit trees; ticks in relation to disease, tick eradication; plant importation and nursery regulations; methods of suppressing insect pests.

Irrigation.—Sites, designs and construction of earthen and other storage dams; canal irrigation; measurement of water; subterranean water; application of water to land; water; laws of Rhodesia.

SALE OF DIP THROUGH THE VETERINARY DEPARTMENT.

Messrs. W. Cooper and Nephews have lately placed on the market a cattle dipping fluid adapted for frequent use on the principle now coming into vogue, for three day or five day dipping. This preparation possesses many advantages, and has been tested by the Veterinary Department with satisfactory results.

With a view to enabling farmers to obtain dipping material at as low a price as possible, arrangements will be made whereby orders may be placed with any officer of the Veterinary Department. The price has been fixed at the specially low figure of five shillings per gallon, delivered at any station or siding desired. Applications must be accompanied by remittances, without which they cannot receive attention. Coin or stamps will not be accepted.

This dip will be used at all public dipping tanks.

IMPORTATION OF PURE BRED PIGS FROM ENGLAND.

The Department of Agriculture is prepared to import, on behalf of farmers, pure bred pigs from England, of the following breeds:—Berkshire, Large Black Sussex; and Large or Middle White Yorkshires.

The probable total cost of such animals delivered to the farmer in Rhodesia, will be:—Boars, £25; Sows, £18.

TERMS.—Applications should be addressed to the Chief of the Animals Industries Branch, Department of Agriculture, Salisbury, and must be accompanied by a deposit of £1 per head which may be forfeited in case of withdrawal or refunded if no animal is supplied, and which will be deducted from the ultimate cost delivered.

Applicants should clearly state the breed, sex and age of the animal they require, and must agree not to dispose of any animal, until payment is completed, without the written

consent of the Director of Agriculture. Applicants must agree to accept the animal allotted to them. The price is payable in instalments of one-third on delivery, one-third after six months, and the balance one year after delivery, and continues to be payable in the event of the death of the animal before the date on which payment is due.

Insurance may, if desired, be effected for this period at the cost of the purchaser. The right of refusal of any application without stating the reason is reserved.

PURCHASE OF PIGS IN SOUTH AFRICA.

The purchase of pure bred pigs within South Africa is also undertaken on behalf of farmers. Particulars may be had on application to the Animal Industries Branch, Department of Agriculture, Salisbury.

EMPLOYMENT ON FARMS.

The Department of Agriculture receives numerous enquiries from persons of varied attainments, age and financial position for openings on farms, as managers, assistants and learners, requiring remuneration on corresponding scales, or willing to give services in return for keep. Farmers and others desirous of obtaining assistance of this description are requested to communicate with the Director of Agriculture, Salisbury, in order that they may be put in touch with the applicants for such openings.

PURCHASE OF STOCK IN THE CAPE AND FREE STATE PROVINCES OF THE SOUTH AFRICAN UNION, ON BEHALF OF FARMERS RESIDENT IN SOUTHERN RHODESIA.

The following amended arrangements are published for general information:—

The Government undertakes the purchase of pure-bred livestock for farmers on the conditions outlined below, and on the following terms of payment, viz.:—(1) a deposit on application; (2) one-third total cost on delivery, less amount of deposit; (3) one-third after six months, and (4) one-third after twelve months—both these instalments bearing interest at 6 per cent. or 10 per cent. if not paid at due date. These terms of credit will only be allowed on purchases up to a

total maximum value of £200 ; sums exceeding that amount are payable in cash along with the first instalment. The Government reserves the right to refuse, without reason given, applications, or to fulfil purchases even after deposit has been made. Applications must be on the prescribed Form "A," and all conditions complied with before same is registered. Applications will be considered in rotation, but fulfilled as opportunity serves, so that animals may be procured as cheaply as possible. The buyer must undertake to accept the animal allotted to him, unless it fails to satisfy description as given in the application form. Disputes may be submitted to arbitration. The purchase price will include all expenses up to time of delivery, price paid to original owner, commission and charges of buyer and freight, including, where necessary, attendance and keep on journey. With every application a deposit must be forwarded ; £1 per head in the case of cattle, horses and donkeys, and 5s. per head for sheep, goats and pigs. Such deposit will be deducted from the amount of the first instalment due, but may be forfeited in the event of the application being withdrawn after having been registered. Stock is not to be disposed of without the written consent of the Director of Agriculture until payment is completed.

Purchases will be made by the Department of Agriculture through its authorised representatives. Every effort will be made to secure animals in accordance with particulars furnished by applicants, and to the best advantage. All purchases must conform strictly to the importation regulations as regards age and freedom from contact with contagious disease. Pedigrees, if obtainable, will be supplied. The Government will bear all risks of transport and of death from any cause until delivery, all losses being chargeable to the vote. All animals failing to pass the necessary test on arrival shall be destroyed and the loss borne by the Government, and another animal purchased for the applicant.

Prospective buyers will be advised of the probable cost. The Department does not undertake to purchase stock at precisely the prices specified by applicants, but will endeavour to approximate as nearly as possible to the figures given and not to exceed same by over 20 per cent. The

authorised representatives of the Department will be allowed a reasonable commission, with expenses additional.

The first instalment will become due and payable on delivery. Applicants or their agents will be advised regarding arrival of their stock, after which all responsibility on the part of the Department will cease.

FORM "A."

Purchase of Breeding Stock : Application.

To the Director of Agriculture, Salisbury.

Sir,—I beg herewith to apply for the under-mentioned stock, to be purchased on my behalf on the conditions set forth on the schedule hereto, with which I declare myself conversant and willing to be bound.

Enclosed find (cheque, draft, etc.) for £....., being deposit due. I agree to pay cash, when called upon, for all purchases (delete following if not applicable) in excess of £200, and for the remainder one-third in cash upon delivery of the said stock, less deposits as above, one-third six months thereafter, and one-third twelve months after delivery, together with interest at the rate of 6%, per annum, from the date of the said delivery, with each instalment as it falls due. Failing the payment of any instalment on due date, the whole of the purchase money, with interest thereon at the rate of 10%, shall immediately become due and payable. Until the final instalment has been paid with interest as above, the ownership of the said stock shall not pass to the buyer, but shall remain the property of the Government, and shall not be disposed of except with the consent of the Director of Agriculture.

Witness my hand at.....this.....day of
.....19...

Signature.....

Witness (1).....

Witness (2).....

I.....of.....do hereby bind myself
as surety for the due fulfilment of the above terms by
.....

Signature.....

Witness (1).....

Witness (2).....

The stock applied for in the foregoing application comprises :—

Breed and Sex.	Limits of Purchase Price, including all charges and delivery. £ to £	Particulars (which will be complied with so far as may be in effecting the purchase.

.....Signature of Applicant.

SCHEDULE TO FORM "A."

Conditions of Purchase of Breeding Stock from British South Africa Company.

The purchaser shall accept the animal or animals allotted to him, unless they fail to satisfy description as given by him in schedule to the application form.

The deposits at time of application are for cattle, horses and donkeys £1, and for sheep, goats and pigs 5s. per head.

Payment of first instalment must be made on delivery.

The Government will meet all losses up to the time notified to purchaser for delivery, after which they shall be entirely at purchaser's risk.

The Government may refuse at any time to undertake or complete purchases without assigning reasons for so doing.

.....
Signature of Applicant

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, soils, crops, processes and kindred matters, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without any indication of where they are from, or why they were sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particular regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is

hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

DESTRUCTION OF WILD CARNIVORA, ETC.

It is hereby notified for public information that rewards for the destruction of wild carnivora, etc., will be paid on the scale and conditions herein set forth.

2. Rewards will be paid as follows :—

For each lion	£5	0	0
For each leopard	1	0	0
For each cheetah	1	0	0
For each hyæna	0	10	0
For each wild dog	0	10	0
For each baboon	0	2	6
For each crocodile not less than 3 feet in length	0	10	0
For each crocodile over 1 and less than 3 feet in length ...	0	2	0
For each crocodile under 1 foot in length... ..	0	0	6
For each crocodile egg	0	0	6

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, of the district, within three months of the date upon which the animal is killed, on a solemn declaration on the prescribed form hereunto annexed.

4. In proof of destruction, applicants for rewards will be required to produce and surrender in the case of a leopard or cheetah the skin with the tail unsevered, and in the case of a hyæna, crocodile, wild dog or baboon the unskinned head. In the case of a lion to produce the skin and skull, the skull only to be surrendered.

5. The skins and heads surrendered for rewards shall become the property of the Government and shall be disposed of in such manner as may be decided on.

FORM OF DECLARATION.

I,.....do solemnly and sincerely declare that I did on the.....day of, and not before, shoot, trap, or poison (as the case may be)..... (describe the vermin for which the reward is claimed) in the district of.....within the boundaries of Southern Rhodesia, and that I am entitled to the reward offered by the Government.

And I make this solemn declaration conscientiously believing the same to be true.

.....
Signature.

Signed and declared at.....
this.....day of.....

Before me,

.....
Magistrate or Justice of the Peace.

CHEMICAL ANALYSIS OF AGRICULTURAL PRODUCTS.

Arrangements have been made for the chemical examination of soils, limestones; grain, and other produce; oil-seeds, cream, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

SERVICES OF AGRICULTURAL ENGINEER.

It is hereby notified for public information that the services of Mr. W. M. Watt, Agricultural Engineer, are available to the public for the following purposes. Assistance may be obtained by farmers :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of

the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

DIPPING TANKS.—GRANTS IN AID.

The Government is prepared to assist farmers in the construction of private dipping tanks by a grant in aid on the £ for £ principle, but not to exceed, however, a total sum of £50.

This grant will only be paid to approved applicants, and after the tank has been inspected by an official appointed for this purpose and found suitable, and on production of receipted accounts in support of their claim.

Applications cannot be considered for grants in aid of tanks already constructed, and those wishing to avail themselves of this assistance should apply beforehand to the Director of Agriculture, from whom full particulars, together with plans and specifications, can be obtained.

SERVICES OF TOBACCO EXPERT.

Farmers wishing to avail themselves of the services of the above should apply to the Director of Agriculture, giving particulars of the nature of advice required, also the distance and direction of their farms from some well-known centre.

DEPARTMENTAL BULLETINS.

The following Bulletins, consisting of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia :—

AGRICULTURE.

- No. 2 The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., L.L.B.
- „ 81 Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S
- „ 61 Requirements in sending Botanical Specimens to the Department for Identification.
- „ 56 The Use of Lime in Agriculture, by G. N. Blackshaw, B.Sc., F.C.S.
- „ 59 Plans and Specifications of Flue Curing Barns.

- No. 71 Report of Forestry in Southern Rhodesia, by J. Sims, F.H.A.S.
- „ 78 Hints on Irrigation—Small Gravitation Schemes—Pipes and Pipe Laying—by W. Martin Watt, Government Agricultural Engineer.
- „ 68 Fertility of Soils and Organic Matter, by G. N. Blackshaw, B.Sc., F.C.S., Government Agricultural Chemist.
- „ 64 Hints on Irrigation—Small Earthen Reservoir—by W. M. Watt.
- „ 79 Winter Cereals, by H. Godfrey Mundy, F.L.S.
- „ 99 Bean Crops, by H. Godfrey Mundy, F.L.S.

CROPS.

- No. 55 How Maize can be made more profitable, by H. Godfrey Mundy, F.L.S.
- „ 112 Notes on Winter Cereals without Irrigation, by H. Godfrey Mundy, F.L.S., Government Agriculturist and Botanist.
- „ 115 Ditto Ditto
- „ 76 Suggestions for Cotton Growers, by R. H. B. Dickson.
- „ 23 The Ground-nut or Pea-nut, by H. Godfrey Mundy, F.L.S.
- „ 92 Manuring of Tobacco on Mr. L. Black's Farm, G. N. Blackshaw, B.Sc. F.C.S.
- „ 57 Onion Growing, by H. Godfrey Mundy, F.L.S.
- „ 67 Maize Breeding and Seed Selection, by H. G. Mundy, F.L.S., Government Agriculturist and Botanist.
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- „ 46 The Head Smut of Maize, by H. Godfrey Mundy, F.L.S.
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- No. 66 Selection of Spraying Outfit, by R. W. Jack, F.E.S.
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 „ 75 Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by R. W. Jack, F.E.S.
 „ 100 Tsetse—Preliminary Notes on the Habits of—by R. W. Jack, F.E.S.

VETERINARY.

- „ 14 Bots in Equines, by R. Ferguson Stirling, M.R.C.V.S.
 „ 54 African Coast Fever, by L. E. W. Bevan, M.R.C.V.S. (revised edition)
 „ 51 Strangles, by F. D. Ferguson, M.R.C.V.S.
 „ 113 Anaplasmoses of Cattle, by L. E. W. Bevan, M.R.C.V.S.
 „ 114 Anaplasmosis of Sheep, by L. E. W. Bevan, M.R.C.V.S.
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Dipping Tanks—Grants in Aid.

Forestry—Sale of Seedling Trees.

Government Notices.

ANIMALS DISEASES AMENDING ORDINANCE, 1911.

Ordinance No. 2, 1911.]

[Promulgated 17th March, 1911.]

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. So much of the "Animals Diseases Consolidated Ordinance, 1904" (hereinafter referred to as the said Ordinance) and of any other law as may be repugnant to or inconsistent with the provisions of this Ordinance is hereby repealed.

2. The Administrator may, on the outbreak of a destructive disease, or when there is suspicion of the existence of such disease, declare an area around and including the place where such disease exists, or is supposed to exist, actively infected for the purpose of this Ordinance.

3. Whenever an area shall have been declared infected in terms of the last preceding section, the Administrator may, for the purpose of suppressing or controlling disease, cause such fences to be erected along the boundaries of or across any farms or land situated in such area as he may deem necessary.

4. (1) If the landowner shall not pay the cost of erecting any fence as aforesaid upon completion thereof, the cost shall be defrayed in the first instance out of moneys provided by the Legislative Council.

(2) When any fence erected as aforesaid runs along the boundary of a farm, the cost of the erection of such fence shall, if not sooner repaid, be repaid, together with interest at the rate of £5 per centum per annum, by equal yearly instalments commencing two years after the fencing is completed, such instalments being so calculated and fixed that the said cost and interest shall be wholly repaid within a period of fifteen years from the date when the first instalment became due.

(3) Such repayment shall be made by the adjoining landowners whose land has been divided by the fence. Each such landowner shall pay one-half the cost of the dividing fence and interest as aforesaid. When the adjoining land is a native reserve, or a portion of such reserve, the one-half of the cost shall be paid from funds in the local Treasury of the British South Africa Company.

(4) When any fence as aforesaid shall be erected within, and not on and along, the boundaries of any farm, the cost shall be paid from the funds of the local Treasury of the British South Africa Company, and the fence, when no longer necessary for the purpose for which it was erected, may be removed by the British South Africa Company; provided that the landowner shall have the right to purchase such internal fence at a price representing the total cost of such fence.

(5) The term "owner" shall mean (a) the person registered as such in the office of the Registrar of Deeds, (b) the British South Africa Company in respect of native reserves, and (c) the local authority in respect of municipalities.

5. Where the bed of a stream or river lies immediately between or constitutes the boundaries of land owned by private owners, the fence may be erected on one or other bank of the river or stream and across it, or partly on one bank, across it, and partly on the other bank, in such manner as may be agreed upon by the owners whose lands are separated by the said stream or rivers. The Administrator may call upon the said owners to agree to the position of the said fence on or before a date fixed by him, and, should they fail to do so, he may cause such fence to be erected without further reference to the said owners. For the purposes of repayment, such fence shall be considered as dividing the lands of adjoining owners, and half the cost shall be recoverable from each owner whose lands are separated by the said stream or river.

6. The Administrator may call upon any owner whose land has been fenced in terms of section 3 or 12 to provide sufficient security for the payment of any sums that may be due to the British South Africa Company in its local Treasury in respect of such fence. If the owner shall fail or refuse to provide such security, the Administrator may cause a notice in writing to be sent to the Registrar of Deeds of the amount due by such owner, and the Registrar shall make an entry thereof in respect of the land fenced. Such entry shall constitute an hypothecation of the land, ranking from the date on which the entry was made and for the amount therein stated; provided that the Registrar may pass transfer of land so hypothecated if the transferee agrees in writing that any sums due and unpaid shall remain and be registered as a charge against the said land.

7. When any land held under lease or permit of occupation has been fenced in terms of this Ordinance, during the term of such lease or permit the lessee or permit holder shall pay to the proprietor of such land yearly, during the continuance of the lease or permit of occupation, interest at the rate of £5 per centum upon so much of the cost of the fence as the proprietor is liable for, and such payment shall be made with the rent of the land, and shall be deemed in law to be part of such rent.

8. Any tenant or holder of land under a permit of occupation having a right to purchase such land at a fixed price shall, on completion of the purchase, pay to the proprietor, in augmentation and as part of the purchase money, any sum paid by such proprietor for the fencing of such land, and shall become and be liable to repay to the British South Africa Company in its local Treasury such sums as remain unpaid, as the same become due and payable in terms of this Ordinance.

9. Where in the case of any local authority the title to land provides that upon the sale thereof the British South Africa Company shall be entitled to receive a proportion of the purchase price, the local authority shall be entitled to deduct from the purchase price of land sold any debt due or amount paid by it in respect of fences on the land so sold erected under this Ordinance.

10. The provisions of sections 14 and 15 of the "Fencing Ordinance, 1904," in regard to repairs shall, *mutatis mutandis*, apply to fences erected in terms of this Ordinance.

11. Where a fence crosses any road used as of right by the public or by any neighbouring landowner, a properly constructed swing gate shall be placed at the point of crossing.

12. Any person opening such gate, except for the purpose of passing through, or omitting to close such gate after having passed through, and any person damaging such gate and omitting to immediately repair such damage, shall be liable to a fine not exceeding £10, or in default of payment to imprisonment with or without hard labour for a period not exceeding one month.

13. The Administrator may, for the purpose of the more effective prevention or control of disease, apply the provisions of this Ordinance in respect of fencing to municipalities and townships and such land adjoining as may be deemed expedient, and to places within a radius of ten miles of an area declared actively infected in terms of section 2 hereof, if, owing to the number of cattle in such places, or other causes, it appears expedient.

14. (1) The owner or proprietor of the land along the boundaries of which fences have already been erected by the British South Africa Company for the purpose of preventing the spread of African Coast Fever in cattle shall be and is liable to repay to the British South Africa Company in its local Treasury one-half of the cost of so much of the fence as may be along the boundary of such land. The provisions of sections 7 and 8 of this Ordinance shall apply in the case of land held under lease or permit of occupation along the boundaries of which fences have already been erected. The British South Africa Company may remove any such fence already erected which is within and not on or along the boundaries of any land when no longer necessary for the purposes for which it was erected.
- (2) Any payment due in respect of any such fence may be made as provided by section 4 of this Ordinance, and under the like conditions as to security for such payment as are prescribed under section 6.

15. Within any area declared by the Administrator to be actively infected under the provisions of section 2, or to which the provisions of this Ordinance shall have been applied in terms of section 12, the Administrator may, for the purpose of more effectively preventing the spread of disease cause to be constructed on any land a dipping tank and any structures incidental thereto or other appliances for the dipping of stock, and may recover the expenditure incurred from the owner of the land on which such tank, structures or appliances have been constructed. The cost of such tank, structures or appliances shall be paid on the same terms and under the same conditions as are applicable to boundary fences under sections 4, 6, 7 and 8 of this Ordinance.

16. In addition to any penalties that may be imposed under the said Ordinance or any amendment thereof, or under any regulations framed thereunder for the unlawful movement of cattle, the Court of the Magistrate before which the case is tried or the High Court in the like instance may direct the confiscation of any cattle unlawfully removed, and such cattle, if infected with disease or likely to convey infection, shall be destroyed without compensation. Should there be no danger of infection the Administrator may order such cattle to be temporarily kept at any spot denoted by him and then sold. The proceeds of any such sale shall be paid to the British South Africa Company in its local Treasury.

17. Section 11, sub-section (1) of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Should any Inspector, Sub-Inspector or any person specially authorised by the Administrator to carry out the provisions of this Ordinance know or suspect that any animal is infected with any destructive disease such Inspector, Sub-Inspector or other authorised person may forthwith place such animal in quarantine, together with such land as is necessary, for its isolation, and such animals as have been or are suspected of having been in contact with such animal or with infection. Notice of such quarantine shall be given in writing to the owner or custodian of such animal and to the Magistrate of the district, and shall remain in force for such time as the Chief Inspector or Controller of Stock may direct, unless the Administrator shall sooner, if he thinks fit, issue the notice referred to in sub-section (2) of section 5. A copy of the notice of any such quarantine shall be posted at the office of the Magistrate, and shall be inserted by the Magistrate in some newspaper, if any, circulating in the district.”

18. Section 16 of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Any Government Veterinary Surgeon or any person thereto authorised by the Controller of Stock, Chief Inspector or by a Magistrate may enter any land, building, kraal or enclosure for the purpose of inspecting animals. Should any animal be found to be infected with any destructive disease, or should such infection be reasonably suspected, he may quarantine such animals as in this Ordinance provided, and may order the proper disinfection of any building, kraal or enclosure in which such animal is or may recently have been, and the furniture and fittings thereof. Should it be impossible to properly disinfect such stable, kraal or enclosure, furniture or fittings in any of them, he may order the destruction thereof; provided that no building, kraal or enclosure shall be destroyed unless the owner consents thereto in writing, or failing such consent, the Administrator orders that such destruction be carried out.”

19. Section 22, sub-section (1) of the said Ordinance is hereby amended by the addition of the following words after the word “obtained” in the twelfth line of the said sub-section, “and any person receiving or taking delivery of any animals without having ascertained that such permit has been obtained.”

20. This Ordinance may be cited as the “Animal Diseases Amending Ordinance, 1911,” and shall be read as one with the “Animals Diseases Consolidation Ordinance, 1904,” and the “Animals Diseases Amendment Ordinance, 1910.”

No. 104 of 1912.]

[28th March, 1912.]

UNDER and by virtue of the powers vested in me by sub-section (7), section 4, of the "Game Law Consolidation Ordinance, 1906," I do hereby authorise the destruction of hippopotami, in or near the Zambesi River within ten miles of and above the Victoria Falls, by members of the British South Africa Police or by other persons acting with the written permission of and under the direct control of the Police.

No. 50 of 1912.]

[8th February, 1912.]

AFRICAN COAST FEVER.

Regulations regarding the movement of cattle and the prevention and suppression of disease.

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 329 of 1910 and 308 of 1911 and make the following provisions in lieu thereof:—

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

General Movement.

3. For the purpose of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed, without special permission:—

- (a) Single farm.
- (b) Two or more adjoining farms, farmed together under one management and situated within one cattle transport area.
- (c) An area, the property of one owner, enclosed by a substantial fence.
- (d) For grazing purposes, an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land.

The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease, or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission, in writing, of an Inspector, Sub-Inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall permit the movement of cattle

- (a) Without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the district over which land or reserve such cattle will pass, whether along roads or otherwise; provided, however, that refusal to grant such consent shall be in writing, and provided further that if the Controller of Stock or the Chief Inspector shall consider that such consent is withheld without good and sufficient cause he may permit of movement without such consent.

If any such person mentioned above refuse to give consent or to state a reason for refusing to do so in writing, no valid objection shall be deemed to exist and movement may be permitted without such written consent.

- (b) Within a veterinary district as defined in the schedule annexed hereto from one transport area to or through another without the consent of the Cattle Inspector in charge of such area.

- (c) From any veterinary district to or through another without the consent of the District Veterinary Surgeon of such district.

Slaughter Cattle.

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same except for the purpose of being slaughtered at the appointed abattoir, and if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock; provided, however, that the Chief Inspector may allow the removal of cattle from such an area under such conditions as he may prescribe.

Transport Cattle.

9. The use of cattle for draught purposes is prohibited except:—

- (1) Within the boundaries of the places defined in section 3, (a), (b) and (c) hereof.
- (2) Within the boundaries of areas already fixed for the use of cattle for draught purposes in terms of regulations published under Government Notice No. 329 of 1910, or such other areas as may be fixed by the Administrator.

10. Notwithstanding the provisions of section 9, no permit shall authorise the working of cattle

- (a) which are not clearly and distinctly branded with the registered brand of the owner;
- (b) in any wagon or vehicle which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

11. No wagon or other vehicle drawn by oxen shall be moved from one cattle transport area into another without the permission of the Cattle Inspectors concerned, and under such conditions as they may impose.

General Provisions.

12. On the outbreak or suspected outbreak of disease, the Administrator may declare an area of infection around and embracing the place of outbreak or suspected outbreak, and a further area or areas around such area of infection as a guard area, whereupon all movement of cattle into and from place to place within such area or areas shall be immediately suspended, except as is hereinafter provided.

A.—In areas of infection and guard areas:—

- (1) Cattle in transit by rail may be moved through such area.
- (2) Cattle from beyond the borders of Southern Rhodesia may be detained within such area or areas *en route* to destination.
- (3) Cattle for *bona fide* farming, dairy and slaughter purposes may be moved into such area or areas by permission of the Chief Inspector and under such conditions as he may impose.

B.—In guard areas only:—

Cattle may be moved into and from place to place within such area under the conditions of section 6 hereof.

13. The removal of green forage, hay, fodder, bedding reeds, manure or of such other articles as may reasonably be supposed capable of conveying infection, shall be prohibited from areas of infection, save and except with the special permission of the Administrator.

14. Whenever an area shall have been declared under section 12 hereof, every person within such area, or within such further area as may be specified by Government Notice, owning or in charge of cattle shall, upon the death

or slaughter because of disease, suspected disease, or accident, of any such cattle, immediately report such occurrence through the nearest Cattle Inspector, Native Commissioner or Police Officer to the District Veterinary Surgeon.

15. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

16. Whenever an area shall have been declared an area of infection or guard area in terms of section 12 hereof, any person who shall allow any cattle to stray or be otherwise removed, except as provided for in these regulations, from any one place within such area to another place, or from a place outside of to a place within such area, shall be guilty of an offence against these regulations.

17. All cattle within the limits of the various commonages and townlands, areas of infection and guard areas as declared under section 12 hereof, or depastured on common grazing ground, shall be dipped or sprayed at least once in every three days, unless the Chief Inspector shall authorise the extension of the time between such dipping or spraying, or the entire suspension of the same.

18. In all areas of infection and guard areas sheep and goats shall be dipped at such periods as may be directed by the Chief Inspector.

19. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Chief Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

20. All permits for the removal of cattle issued under the provisions of the said Ordinance or of any regulations framed thereunder shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

21. No permit issued for the movement of cattle shall be taken to authorise any trespass in connection with such movement.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks or unless they have been effectively cleansed by dipping, spraying or other process, within fourteen days of being allowed on such road or other place. Any beast having ten or more ticks on it shall not be considered free from ticks.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months,

SCHEDULE "A."

VETERINARY DISTRICTS OF SOUTHERN RHODESIA.

(1) *Salisbury.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

32. Battlefields; 33. Hartly and Gatooma; 34. Gadzema Station; 35. Makwiro Station; 36. Norton Siding; 37. Hunyani Tank; 38. 164½ Peg B. & M. & R. Railways; 39. Salisbury A.; 40. Salisbury B.; 41. Salisbury C.; 42. Salisbury D.; 43. Arcturus; 44. Bromley; 45. Marandellas North; 46. Marandellas South; 48. Headlands Station; 49. Junction, Mazoe and Lomagundi Railways; 50. 23-Mile Peg, Lomagundi Railway; 51. Passaford Station; 52. 35-Mile Peg, Lomagundi Railway; 53. Gwibi Tank Halt; 54. Banket, Lomagundi; 55. Eldorado, Lomagundi; 56. Selby Siding; 57. Mazoe; and 58. Kimberley Reefs.

(2) *Bulawayo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

1. Plumtree; 2. Marula Siding; 3. Figtree; 4. Westacre Junction; 5. Bulawayo Area; 6. Hazaney Junction; 7. Bembesi Station; 8. Insiza North; 9. Insiza South; 10. Shangani North; 11. Shangani South; 14. Redbank; 15. Nyamandhlovu Station; 16. Malindi Station; 17. Wankies Area; 18. Matetsi Siding; 19. Matopo Terminus; 20. Sabiwa Siding; 21. Gwanda Station; 22. West Nicholson; 23. Belingwe; 59. Essexvale and Balla Balla Areas; 60. Stanmore Siding Area; 61. Filabusi Area.

(3) *Gwelo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

12. Somabula Siding; 13. Gwelo Station; 24. Selukwe Area; 25. Surprise Area; 26. Indiva Siding; 27. Lalapanzi; 28. Iron Mine Hill Siding; 29. Umvuma Siding; 31. Que Que Station.

(4) *Umtali.*

An area comprising the native districts of Umtali, Melsetter, Makoni and Inyanga.

No. 175 of 1912.]

[30th May, 1912.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the provisions of Government Notices Nos. 47 and 254 of 1910 (and 51 of 1911), the removal of cattle to within that portion of the prescribed areas westward of the Salt River, Tuli district, may be allowed under permit from the Chief Inspector, for the purposes of grazing and watering.

No. 35 of 1912]

[25th January, 1912

IMPORTATION OF PLANTS, ETC., REGULATIONS.

WHEREAS the insect pest known as San Jose or pernicious scale (*Aspidiotus perniciosus*, Comstock) has been discovered infesting nursery stock, fruit trees and other plants in the Province of Natal in the Union of South Africa.

Now, therefore, under and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that, from and after this date and until further notice, the introduction into Southern Rhodesia of any plant or plants, not being fruit, seeds, bulbs, cut flowers, vegetables or vegetable transplants, grown in the Province of Natal in the Union of South Africa is prohibited, unless special permission in respect of each consignment be first obtained from the Director of Agriculture, Salisbury, Southern Rhodesia.

No. 41 of 1912.]

[1st February, 1912.

FENCING ORDINANCE, 1904.

UNDER and by virtue of the powers conferred upon me by the "Fencing Ordinance, 1904," I do hereby define the area as described hereunder to be a district for the purpose of the said Ordinance, and, in terms of section 4 thereof, bring the provisions of the said Ordinance into operation in the aforesaid district.

DESCRIPTION OF AREA.

That portion of the native district of Selukwe within the following boundaries:—

From the north-east beacon of the farm Depoto, along the eastern boundary of that farm and the farms Umcima, Adare, Selukwe Peak, Outward Bound, Pont Vaen and Ortner's to the south-eastern beacon of the latter; thence along the southern boundary of Ortner's and the eastern, southern and western boundaries of Brooklands, the western boundaries of Aberfoyle Block, Educational, Wall Close and Kanuck to the north-eastern beacon of the latter; thence along the northern boundaries of Kanuck, Divide, Educational, Safago, Tibilikwe and Depoto to the point first named.

FENCING ORDINANCE, 1904.

NOTICE is hereby given that it is the intention of owners of landed property situated in the district of Insiza, as described below, to petition His Honour the Administrator to bring into force and apply the provisions of Part I. of the Fencing Ordinance of 1904 to the undermentioned area:—

DESCRIPTION OF AREA.

That part of the district now known as Insiza South within the following boundaries:—From the north-east of Blackwaters Farm, thence along the boundaries of Carlssen's, Glenorchy, Glenavon, N'dumadombi, Pioneer Farm, Altyre, Three Fingers Outspan, Foxdale, Heathfield, Woodstock, Indutwa, Kildare, Lancaster, York, Indina, Wessels Block, Nauhoho Block, Field Farm, Ungungesse, Tekwe Outspan and Magoholo.

No. 111 of 1912.]

[4th April, 1912.

ESTABLISHMENT OF POUND ON FARM CARDROSS PARK.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Bulawayo, a pound has been established on farm Cardross Park, near Fort Usher, in the district of Bulawayo, and that the said pound shall be available for the public from the 12th day of April, 1912.

No. 112 of 1912.]

[4th April, 1912.

ESTABLISHMENT OF POUND AT LALAPANZI.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Gwelo, a pound has been established on the farm Lalapanzi, in the district of Gwelo, and that the said pound shall be available for the public from the 15th day of April, 1912.

No. 165 of 1912.]

[16th May, 1912.

ESTABLISHMENT OF POUND ON FARM STONEHAM.

UNDER and by virtue of the powers vested in me by Section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Bulawayo, a pound has been established on the farm Stoneham, in the district of Bulawayo, and that the said pound shall be available for the public from the 28th day of May, 1912.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of section 11 of Government Notice No. 45 of 1909 to be in force over the area within a radius of fifteen miles of the farm Cairn-na-Cuihme, in the Victoria district, for a period of six weeks from and including the 18th of May, 1912.

No. 203 of 1911.]

[15th June, 1911.

GAME LAW CONSOLIDATED ORDINANCE, 1906.

UNDER and by virtue of the powers conferred upon me by the "Game Law Consolidation Ordinance, 1906, I do hereby extend the provisions of Government Notice No. 40 of 1909, as amended by Government Notices Nos. 128 and 129 of 1909, for a further period of one year from the 30th June, 1911.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.
Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding

or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 160 of 1910 withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1911, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Bulawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 353 of 1911.]

[16th November, 1911.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby suspend the operations of sections 9, 10 and 12 of the said Ordinance until the 30th November, 1912, in regard to game in class "B," and the following game in class "C," viz.:—Eland, koodoo, zebra and Burchell's zebra or quagga, within the following area:—

DESCRIPTION OF AREA.

An area bounded by a line drawn from the junction of the Merowa and Umfuli rivers, up the Umfuli to its junction with the Susenje, thence up the Susenje and Massome rivers to the headwaters of the latter; thence to the drift where the Sinoia-Urungwe road crosses the Inyonga river; thence northerly along this road to the Chidzurgwe hill; and thence direct to the junction of the Merowa and Umfuli rivers.

No. 110 of 1908.]

[16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
- (2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
- (4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.
- (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcasses thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.
- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—

- (1) Importation shall be through and direct from the Coast Ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
- (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
2. Number and Class of cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
4. Area or Farm and District to which Cattle are to be moved.....

Applicant's Signature.....

Date

Application

Permit No.

ANNEXURE "B."

I,.....
 residing on the farm
 in.....do solemnly and sincerely
 declare that the..... (number in
 writing) animals also enumerated below have been in my possession since
 birth, and that lung-sickness, pleuro-pneumonia or other contagious or
 infectious disease has not existed amongst any of my cattle, nor on my farm,
 nor among any cattle with which these animals have been in contact within
 the last four years, and that these animals have never been exposed for sale
 in any public market or stock fair, nor been in contact with strange cattle,
 and that to the best of my knowledge and belief such cattle in travelling to
Station (*i.e.*, station where cattle are to be
 trucked) will not come into contact with any animals amongst which lung-
 sickness or any other contagious or infectious disease has existed during that
 period.

Number of Animals.....Bulls.....Heifers.....

Breed.....

Seller's Name and Address.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent

And I make this solemn declaration conscientiously believing the same to be
 true.

Declared to at.....on this.....

day of.....before me,

Resident Magistrate for the district of

No. 211 of 1910]

[4th August, 1910.

IMPORTATION OF CATTLE FROM NORTH-WESTERN
 RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals
 Diseases Consolidation Ordinance, 1904," I do hereby declare and
 make known that, notwithstanding the prohibition contained in Gov-

ernment Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

(a) the districts from which they come and through which they pass are free from contagious diseases of animals;

(b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for.

ANNEXURE "A."

Certificates under Section 3.

(a) I certify that I have examined the following cattle belonging to Mr.

.....cows and heifers,
.....calves,
.....oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....
Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr.

.....cows and heifers,
.....calves,
.....oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....
Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

No. 79 of 1910]

[7th April, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby direct that

all cattle found within an area of twenty miles of the Crocodile River, in the native districts of Tuli and Chibi, in contravention of the provisions of Government Notice No. 47 of the 10th March, 1910, shall be forthwith destroyed.

No. 254 of 1910.]

[22nd September, 1910.

SOUTHERN BOUNDARY.

UNDER and by virtues of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

1. All cattle within an area of twenty miles from Shashi and Ramaguabane Rivers in the native districts of Tuli-Manzamyama and Bulalima-Mangwe, save and except westwards of the south-eastern boundary of the Mphoeng's reserve, shall, within one month from date hereof, be removed therefrom by the owners to such place or places as shall have been approved by the Native Commissioners of the said native districts respectively.

2. The introduction of all cattle into the aforesaid area is prohibited.

3. Any person refusing or neglecting to remove cattle from the area, as herein provided or introducing cattle into such area, shall be liable to the penalties provided by the aforesaid Ordinance, and all cattle found in the said area in contravention of this Notice shall forthwith be destroyed.

No. 391 of 1908]

[17th December, 1908

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdrew the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district

in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

- (a) For every separate registration of a brand, 5s.
- (b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

- i. Off Neck or Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

- i. Off Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

- i. On Near Side or Ribs;
- ii. Near Rump (or Thigh);
- iii. Off Shoulder;
- iv. Off Side or Ribs;
- v. Off Rump (or Thigh).

(d) In the case of ostriches:—

- i. On Near Thigh;
- ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to

place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette."

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be reallocated until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

No. 45 of 1909]

[13th March, 1909

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 223. of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcasses of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

No. 336 of 1911]

RABIES.

[26th October, 1911

THE following instructions regarding the treatment of persons bitten by rabid animals are published for general information.

In every case where a person has been bitten by a dog or other animal known, or suspected, to be rabid the following precautions are recommended:

- (1) The wound should be immediately and thoroughly cauterized. This, if it does not altogether prevent the disease, delays its onset sufficiently for Pasteur treatment to be successfully applied.
- (2) The patient should be sent to Salisbury for treatment at once. Delays are dangerous.
- (3) The fullest information should be sent to the Health Department as to date when bitten, locality, fate of dog, and especially reasons for supposing the dog to be mad.

No. 240 of 1910.]

[1st September, 1910.

INSECT PESTS.

UNDER and by virtue of the powers vested in me by the "Nursery Ordinance, 1909," I hereby proclaim the undermentioned insects to be pests within the meaning of the said Ordinance:—

The Red Scale (*Chrysomphalus aurantii*)
 The Oleander Scale (*C. hederac*)
 The Circular Purple Scale (*C. aonidium*)
 Ross's Black Scale (*C. rossi*)
 The Purple or Mussel Scale (*Lepidosaphes beckii*)
 The Long Scale (*L. gloverii*)
 The White Peach Scale (*Aulacaspis pentagona*)
 Woolly Aphis or American Blight (*Schizoneura lanigera*).

No. 309 of 1909]

[30th December, 1909

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from overseas, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expense of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

No. 306 of 1911.]

[5th October, 1911.

IMPORTATION OF PLANTS, ETC., REGULATIONS.

WHEREAS the insect pest known as San Jose or pernicious scale (*Aspidiotus perniciosus*, *Comstock*) has been discovered infesting nursery stock, fruit trees and other plants in the Transvaal Province of the Union of South Africa.

Now, therefore, under and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that, from and after this date and until further notice, the introduction into Southern Rhodesia of any plant or plants, not being fruit,

seeds, bulbs, cut flowers, vegetables or vegetable transplants, grown in the Transvaal Province of the Union of South Africa is prohibited unless special permission in respect to each consignment be first obtained from the Director of Agriculture, Salisbury, Southern Rhodesia.

No. 249 of 1908]

[27th August, 1908

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

Department of Posts and Telegraphs,

Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

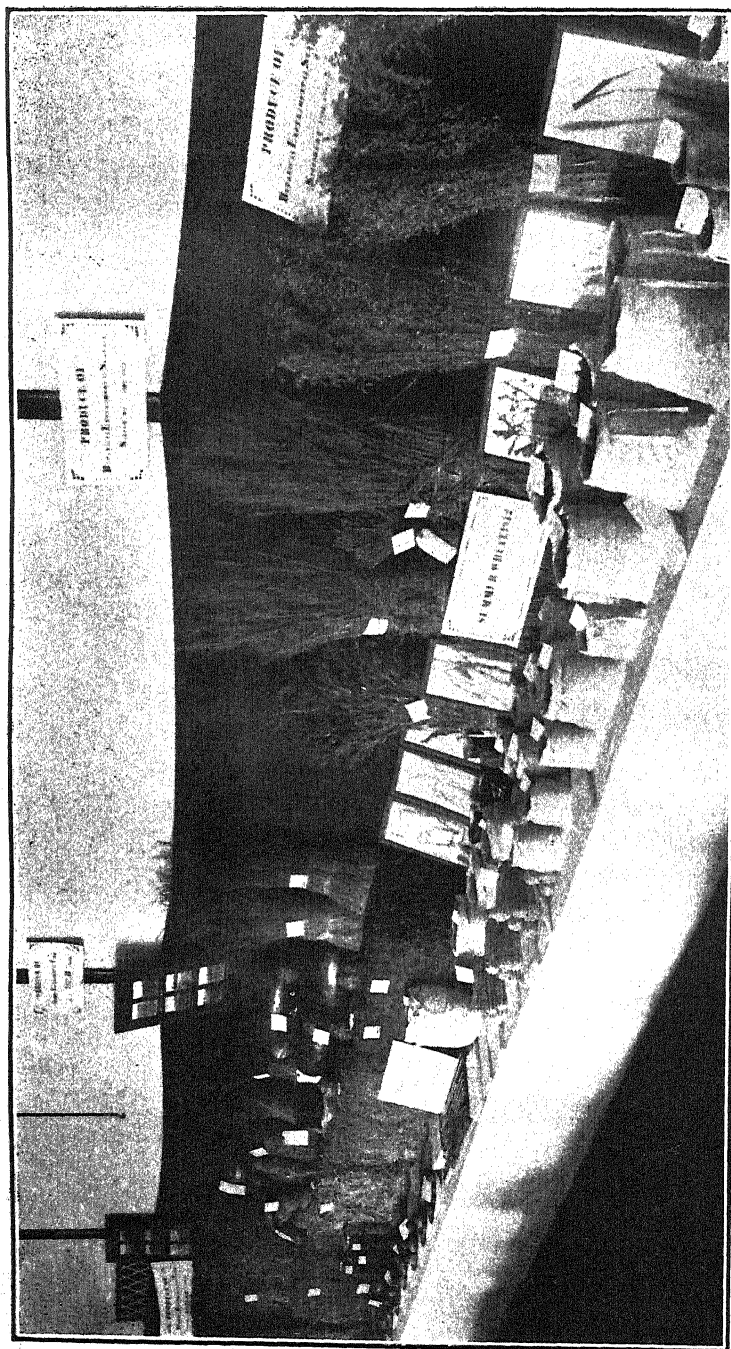
The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.



Untali Agricultural Show, 1912. Exhibits of the Agricultural Department.



THE RHODESIA
AGRICULTURAL JOURNAL.

*Edited by the Director of Agriculture
assisted by the Staff of the Agricultural Department.*

PUBLISHED BI-MONTHLY

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Editorial.

Correspondence on subjects affecting the farming industry of Southern Rhodesia is invited. Enquiries will be replied to direct, or through the medium of the JOURNAL. An interchange of ideas and suggestions between farmers will be particularly welcomed. Contributions of a suitable nature for insertion in this JOURNAL will be much appreciated. All communications regarding these matters, and advertisements, should be addressed to the Editor, Department of Agriculture, Salisbury.

UMTALI AGRICULTURAL SHOW.—Umtali held its Annual Agricultural Show under pleasant auspices on the 11th and 12th of July. The general quality of the exhibits was exceptionally high, but the entries were much less numerous than might have been expected. In this respect the show was decidedly disappointing, as it failed entirely to convey a true reflection of the farming conditions of the district. On the other hand, the quality of the wheat, maize, beans, tobacco and oranges shown, left nothing to be desired,

and demonstrated conclusively what may be done, and in what direction farmers round Umtali are to look for success. The Society has now secured a permanent show ground near the railway, and next year should see it established in its new home.

IMPORTATION OF CATTLE POSTPONED.—It is with much regret that we have to announce the postponement of the importation of pure bred bulls and heifers from England for distribution to farmers. The animals had been procured and were about to be shipped when foot and mouth disease broke out in England in several places, necessitating the cancellation of the arrangements. This is most unfortunate, as again a season is lost, for even should the outbreak be promptly suppressed, it will be some months before the cattle can be shipped.

RURAL TELEPHONES.—At the last Farmers' Congress, held in Gwelo, a resolution was adopted requesting the Government to extend telephonic communications to farming districts, and to give facilities for isolated farms to be connected with the outer world by telephone. The matter had already been engaging the attention of the Government, and we now call attention to the announcement of a scheme to attain the desired end published in Postal Notice No. 32 of 1912.

Individual farmers connected to a common centre will be enabled to communicate with one another as well as to their post office or station free, and through these to towns or other centres at the ordinary tariff for long distance calls or telegrams as the case may be.

As against the tedious process of sending a boy with a note many miles the telephone is an enormous help and economy, whilst for use in emergencies its value is obvious. The notice issued by the Department of Posts and Telegraphs will be found amongst the Government Notices published in this issue.

FARES FOR FARM LABOURERS.—We call attention to the

following intimation issued by the General Manager of the B. & M. & R. Railways :—

“ With effect from 1st August, 1912, for a period of twelve months, trained native or coloured farm labourers recruited for *bona fide* farm work in Rhodesia will be conveyed in batches of not less than six, or paying therefor, at the rate of $\frac{1}{2}$ d. per head per mile from Vryburg to destination station. Applicants for the concession must present, at starting point, a certificate from the farmer to whom they are engaged to the effect that they are for work on his farm as *bona fide* farm labourers.”

RAILWAY RATES ON BREEDING STOCK.—Intimation has been received from the General Manager of the South African Railways to the effect that, in view of the low rates charged by the South African Railways for the conveyance of livestock, it has been decided that the existing arrangement for allowing rebate on stock sent from the Cape Province to Southern Rhodesia will not be continued after the end of this year.

VERMIN.—The losses to stockowners through the depositions of wild carnivora in Rhodesia are not inconsiderable. The following comparative statement of wild animals for which rewards have been paid is of interest :

		1911	1910	1909
Lion ...	...	88	39	53
Leopard	...	255	197	134
Cheetah	...	50	20	26
Wild Dog	...	109	45	35
Crocodile	...	43	17	14
Hyena ...	...	14	—	—
Baboon	...	1,062	—	—

CIGAR LEAF EXPERIMENTS.—Attention is drawn to the article appearing in this issue, intimating the free distribution of tobacco seed suitable for cigar leaf to farmers for experi-

mental purposes. It is hoped that farmers will co-operate with the Department in endeavouring to ascertain if cigar leaf can be grown in the Territory, for any reasonable measure of success achieved in this connection must have a very beneficial effect on the tobacco industry in this country, which is now in a particularly promising position.

THE TOBACCO CROP.—It is estimated that the crop now reaped and cured should approximate one and a half million pounds of leaf.

Some 2,635 acres of land were under tobacco, but the crop is light owing to the dry weather during the growing season, whilst early and severe frosts have somewhat reduced the amount of leaf harvested. Had the early season been more favourable a much larger acreage would have been sown, but the prospects are all in favour of a largely increased area under tobacco next year.

POULTRY.—It does not appear that the Rhodesian farmer is as yet availing himself of his opportunities with regard to poultry keeping. Eggs imported into Rhodesia during 1911 numbered 1,940,166, valued at £10,405, as against 1,385,982, valued at £7,299, in 1910. Fowls are largely imported, the value of imports during the year being £5,935, yet the local prices of eggs and poultry continue at a level altogether disproportionate to the cost of production. It is apparent that this side line of the farming industry is not exploited to anything approaching the limits of its possibilities, and that there is great room for profitable development in these directions. The recent census return gives the number of poultry of all sorts kept by Europeans as 33,764, against 65,841 in 1904, a reduction of nearly one-half, a falling-off which is the more serious and unaccountable when the contemporaneous increase of the white population by 87 per cent. is considered, as well as the high prices of poultry and eggs, and the above figures relating to importation.

Extracts from the Report of the Director of Agriculture

FOR THE YEAR ENDED 31ST DECEMBER, 1911.

Presented to the Legislative Council.

The year began well with copious rains, and the season promised to be a fair average one. Continuous later rains did some slight damage to crops, and it became apparent that neither native nor European crops would be so plentiful as in the preceding year, although no serious shortage was anticipated. An unprecedented rainfall in May, just when the tobacco crops were being cured, adversely affected the quality of the leaf; ground nuts also suffered from this unseasonable rain, as did maize left out in the fields for shelling—a perfectly safe proceeding in normal seasons. The ploughing season, commencing usually in October, was hampered by a deficiency alike of labour and of rain, and as time went on it became clear that the wet season was to be unusually late. Early sown crops failed, and a good deal of resowing was necessary. Except in a few localities, practically no rain fell until well on in December, and the heat during this prolonged dry season was exceptionally severe. In consequence, the season in general is late, all crops being retarded, and this must adversely affect the harvests of 1912, even if early frosts do not cause material injury. The rain has, however, usually been sufficient to make the veld good, and stock looked remarkably well at the end of the year. Stock was comparatively free from pest and disease, and such losses as were reported were mainly from lions, leopards and lightning.

The statement of crops produced in 1911, according to the census returns and the corresponding figures at the previous census in 1904, furnish interesting reading. The total area under cultivation during the year, excluding vegetable gardens and land cultivated by natives for their own

benefit, is given at 132,105 acres; but these figures can only be regarded as approximately correct, as farmers only furnish general estimates. The estimated acreage of native crops under cultivation is given at 868,173 acres. The increase in all European crops since last census has been very considerable. The recorded figures for maize are 393,166 bags, an increase of 758 per cent. in seven years. Of this, 307,635 bags are credited to Mashonaland, and 85,531 bags to Matabeleland. The growth of the export trade in maize is instructive, as shewing a steady increase, in spite of fluctuating local market conditions, and as demonstrating the commercial value of the facilities arranged for export and disposal in the European market :—

Year		Quantity lbs.		Value £
1907	..	27,308	...	95
1908	...	53,847	...	246
1909	...	2,288,453	...	6,023
1910	...	5,911,123	...	11,973
1911	...	8,272,553	...	16,878

The yield of maize per acre was considerably lighter than in the previous year, and generally fell short of expectations.

Tobacco has now quite passed out of the probationary stage, and may be regarded as one of our most valuable crops, the cultivation of which promises to assume very important dimensions. The census return gives 606,219 lbs. grown in 1911 as against 147,355 in 1904. A great merit of tobacco is that with less capital than in other forms of farming, and in a comparatively short time after commencing operations, it is possible to secure a good return. Tobacco has also given new value to the light sandy soils. Knowledge of the crop, particularly as regards the curing of the leaf, is at present the chief need of the tobacco grower, and it was to meet this that a specialist on the subject was added to the staff of the Department during this year. There is much connected with tobacco that can only be acquired by personal observation and demonstration, and the time of the expert is being mainly devoted to personal visits to the growers at different seasons of the year, but especially during the curing time, to give advice and instruction on the spot. Experimental work to improve methods of treatment, to test new

varieties of leaf, to compare different artificial fertilizers, and to ascertain the possibilities of growing a good cigar type of tobacco, will also be undertaken. The sale of the 1911 crop at the Salisbury warehouse was a conspicuous success, and will undoubtedly lead to the further extension of tobacco culture, an increase which is to be welcomed, as there is no fear of the supply exceeding the demand for a long time to come, provided the quality is maintained, and every effort made to produce bright leaf.

A feature of the winter season was the success and rapid extension of the cultivation of cereals, particularly wheat, on naturally moist land without irrigation. There is no longer any doubt of the practicability and profitableness of this proceeding. Wheat has increased since last census 190 per cent., although the total figure is only 3,606 bags. There is every reason to anticipate a marked extension in the next septennium of not only wheat, but also of oats, barley and rye. The oat-hay crop is given at 5,790,900 lbs., and that of manna-hay 5,320,000 lbs., each more than double the previous return. Peas and beans shew a gain of 960 per cent., though totalling only 4,019 bags, much below our requirements.

Certain crops are chiefly grown for consumption on the mines. For this market, permanent and distributed throughout the country, a quite inadequate amount is produced at present; only 3,266 bags of ground nuts are recorded in the census. Potatoes are returned at 48,836 bags, onions at 11,832 bags, and sweet potatoes at 9,318 bags, pumpkins are recorded as 772 tons, whilst roots, such as mangolds, turnips and beets, are given at 659 tons. None of these returns can be regarded as very precise, but only approximate, yet the supply indicated is still insufficient for mining needs. An interesting item is that of coffee, which in 1904 was only 62 lbs., and in 1911, 13,688 lbs., all produced in the Melsetter district.

A feature of the times which the census does not bring out is the increasing attention that is being paid to a variety of other crops which are emerging from the experimental stage, indicating their potential importance and what may be accomplished when the agricultural resources of the country are fully developed.

Oranges and lemons are being planted in increasing numbers, although as yet no commerce in these fruits has been established. They grow so readily, however, and the need is so obvious, that farmers are well advised to plant citrus trees. The possibilities of an oversea trade as well as of a local market have been experimentally demonstrated. The number of citrus trees of bearing age is, according to the census, 49,026. Of these, 5,757 are situated in towns and villages. Judging from observation, the number of young trees not yet producing fruit is many times greater. The total number of fruit trees in bearing in Southern Rhodesia is given as 222,782, which is the equivalent of roughly an acre to each occupied farm in the country. Fruit is chiefly grown for domestic consumption, and there are few, if any, farms without some. The census shows only seventy-five farms with over 450 fruit trees (say five acres each), only fourteen with over 1,000 trees, and but two instances of over 5,000 fruit trees of all kinds. Local consumption accounts for all that is marketed, and very much more besides from the fruit-growing districts of the south. The fruits which give most promise are, besides oranges, naartjes, grape fruit, lemons and citrons, the more tropical classes, such as mangoes, pawpaw, pineapple, loquats, bananas, granadillas, guavas, persimmons and tree tomatoes. Melssetter district takes a leading place in fruit growing, possessing over one quarter of the fruit trees in the country. Inyanga apples have a local reputation, whilst in Mazoe and Victoria citrus culture has of late been receiving much attention.

The agricultural activity of previous years has been well maintained in spite of the depressing effect of the shortage of labour, but for which, indeed, a much greater measure of progress would have been recorded. There are constant signs of a growing interest in public affairs and of an ever-increasing confidence in its resources and prospects on the part of the land holders: the fixed and most permanent section of the community.

The list of our leading exports is instructive and encouraging. There is a steady rise during the last three years in our exports of hides, skins, maize, tobacco and onions. The reduction of the export of kaffir corn is hardly to be regretted, indicating as it does in part a replacement

of that crop by the more economically useful maize, and in part the larger local consumption, although it is also due in some measure to the deficiency of native crops in some districts during the past season. The export of timber has received a check, which is probably only temporary. Rhodesian ambitions are directed more to the supply of the growing local markets than to sending food-products out of the country, and the list is not exhaustive, so that the measure of these surplus commodities is the more gratifying. The hides and skins are, of course, a very accurate gauge of our increasing local consumption of meat, as at yet no tanning industry exists in the country and the quantity brayed at home for reims is negligible.

EXPORTS FROM SOUTHERN RHODESIA.

	1911		1910		1909	
	Quantity lbs.	Value £	Quantity lbs.	Value £	Quantity lbs.	Value £
Hides, ox and cow	225,944	7,614	208,699	7,292	151,765	4,908
Skins, sheep and goat	142,063	4,747	136,038	4,413	85,563	2,804
Kaffir Corn ...	588,602	1,720	1,174,261	3,103	1,413,473	4,090
Onions	60,131	680	37,948	319	41,123	345
Tobacco (unmanu- factured) ...	413,852	34,810	322,334	27,028	190,822	11,002
Wood (cubic feet)	2,671	663	10,082	2,519	...	947
Maize	8,272,553	16,878	5,911,123	11,973	2,288,453	6,023

The figures for the importation of agricultural implements, value £24,450 for 1911, shew a slight falling off as against £26,949 for 1910, but this is attributable rather to the accidents of trade and the arrival of consignments than to any reduction in demand. The importation of cement, largely used for agricultural purposes, particularly in dipping tanks, has been nearly doubled, and would have been very much larger but for the prohibitive cost inland. The position has been realised by the railways, and to some extent ameliorated by a reduction in the rates from Beira, although it is apparent that a further reduction would still greatly increase the scope of use of this necessity of modern life.

In the vicinity of Salisbury the aspect of farms has of late undergone a very marked change in directions which we may take as true tokens of progress. The majority of farms are now fenced, and possess substantial brick buildings, together with cow sheds and dairies, flue-curing barns, power threshing outfits and dipping tanks, according as dairying, tobacco, mealie growing, cattle raising, or combinations of these industries are chiefly being pursued.

Within reasonable reach of the larger towns, especially round Salisbury and Gwelo, and near mining centres as at Hartley, Gatooma, Kimberley Reefs and Odzi, the price of land owing to the demand, has risen 30% to 50% during the year. Similarly the extension of the railways to the Mazoe Valley and to Victoria has caused an inflation in land values. Even in outside districts farms have gone up in price. This is the surest sign of public confidence, as high prices are only paid where immediate and beneficial occupation is intended, and where the necessary money for developing the farms bought is also available. Where private sales have taken place the sellers have almost invariably bought land further out, with a view to reclaiming afresh the wilderness, whilst another encouraging indication is the frequency with which money made in mining is transferred to and invested in the sister industry.

An influx of farmers of a desirable stamp has been a feature of the year in the districts round Gwelo. This is a natural consequence of the railway extension to Umvuma, opening up as it does a considerable stretch of good country. One result has been that the price of cattle has risen 20 to 25 per cent. Another sign is the introduction of several hundred merino sheep, which have thrived well so far, and bid fair to become a feature of the district. The development of the district is likely to receive a stimulus from the sub-division of the commonage of Gwelo and the creation of a number of small holdings in the vicinity.

The Hartley district has advanced more than others during the year, settlers being attracted, no doubt, by the mining activity, especially in the vicinity of Gatooma. The local demand for minor produce—vegetables, eggs, milk, fruit—is very largely met from local supplies, a state of affairs not everywhere found. Farmers in this vicinity, are

catering for the requirements of natives employed on the mines, and the acreage under potatoes, sweet potatoes, beans and monkey nuts is considerable and increasing. Whilst a ready market is a great boon, yet a countervailing disadvantage of the nearness of the mines is the scarcity and high cost of farm labour. Agricultural development has been active also at Norton and Makwiro, and in all directions good progress is being made.

Victoria has long been recognised as one of the finest pastoral districts, and much stock has regularly been purchased there for settlers elsewhere. A considerable number of good bulls has been introduced during the year, and these must soon show an effect. A number of farmers has of late gone in for pigs on a larger scale. The extension of mining in the district, both for gold and tin, and the prospect of the railway reaching Victoria at an early date have exercised a good effect, and caused a marked increase in the area under the plough. Stock is thriving, land values are rising, and prospects are bright in Victoria.

In remote Melsetter, a feature of the year's progress has been the erection on quite a number of farms of substantial homesteads of brick or stone, replacing the temporary buildings of earlier years. There is little inducement in this district, in spite of the fact that it is supporting a fairly numerous farming population, to produce at present much more than is required for local consumption. The cultivation of coffee is extending, whilst on several of the lower farms successful experiments in tea planting have been conducted. Melsetter has long shown itself well adapted for sheep, and indeed surpasses all other districts in this respect. At present the flocks number about 14,000 with capacity for very many more.

The outlying and somewhat neglected district of Tuli has made a notable advance this year, the Liebeg Company having actively developed as a ranching proposition their recently acquired property, introducing over a thousand head of cattle from Cape Colony, as well as buying largely locally. A very promising start had been made with this undertaking, the success of which is greatly to be desired. Similar ventures on a smaller scale are coming into being in various

parts of the country, notably in the Tuli district on the one hand, and Mazoe and Lomagundi on the other.

The condition of the natives, agriculturally, is prosperous. Apart from partial failure of crops in certain areas, owing to deficient rains, and a rather more serious outlook as regards the harvest in the coming year, the average native is well off, and in very different circumstances to what he was even a few years ago. Security in ownership of cattle, instead of their being regarded as the property of the paramount chief, protection of life and limb, ample scope in the more than ample reserves for grazing and cultivation have brought about notable economic changes. The cattle are being utilised both for farm and transport work. Spans of donkeys are being purchased, and horses, a luxury still beyond the reach of many white farmers, are bought at high prices.

There is a growing tendency for the native to become a small farmer, growing and marketing his own crops, and in these respects he is in a much more favourable position than the white farmer, both as regards land tenure and labour. In some districts of Matabeleland there are now very few kraals where the plough is not used: generally that favourite old South African pioneer, the "75." As the native learns to use oxen for draught purposes he becomes less willing than ever to sell cattle or to work for wages on farms and mines, whilst the higher prices now paid for native stock still further adversely affect the labour supply.

The ebb of the labour supply which set in during August, 1909, became steadily more and more acute owing to the withdrawal of time-expired boys to Nyasaland, for whom no substitute could be found. The agricultural progress of the country has without doubt suffered a very severe set-back on this account; many would-be settlers were being discouraged, whilst others have been unable to carry on even normal farm operations, on which their living depends. Labour was not forthcoming to harvest the crops, mealies stood in the lands throughout the winter, and considerable losses were thus occasioned. It was not possible owing to this prolonged and retarded harvesting to form accurate estimates of the crop in the country, which led to miscalculation by both growers and buyers, and considerably hampered trade. No hands were available, similarly, for

handling and threshing other crops, such as Boer manna and beans, and losses thereby were considerable, some suffering more than others. When the planting season came round there was a diminished acreage ploughed, and there have not been enough boys to hoe even these reduced areas. With routine work thus restricted, there was of course no labour available for permanent improvements, new work, nor for the expansion so necessary on every farm in a young country. Development was paralysed, and many useful undertakings indefinitely postponed. There was a not unnatural outcry, and to meet the difficulty temporarily, and purely as an emergency measure, the machinery of the Native Department was employed to appeal to chiefs and headmen to supply the most pressing wants at specially high rates.

Concurrently with the diminished supply there is a steadily increasing demand, and the situation must be regarded as very grave. It cannot be said that the unwillingness of the local native to work is due to ill-treatment. The labour itself is not worth much, and demands constant supervision and instruction, but it is impossible to do without it. Enhanced wages, as has been conclusively proved, are not the requisite incentive. A succession of good seasons and the consequent absence of the world-wide motive for labour—hunger—have put the young men out of the habit of work, whilst the attractions of mine and town labour appeal to them more than previously. The prolonged planting season this year, owing to the erratic rainfall, and the abundance of beer, have been additional reasons for the shortage of labour. No doubt the behaviour and actions of the individual white employer are prime factors in his getting or lacking boys. It speaks well for our farmers as a class in this connection, that, on leaving, the Nyasa boys constantly expressed their desire and intention to return if possible to the same masters, a hope warmly reciprocated. There is a general tendency to improve the condition of farm boys in respect of accommodation and feeding, which appeals more to them than wages. Rivalry between neighbours, in their eagerness to obtain labour during a critical but brief period, may lead to a dangerous situation. Reasonable quarters in accordance with the native's natural habits and inclinations, ample food and regular payment of wages are the chief desiderata,

and are very generally accorded. The shortage is most acutely felt at planting time, but everywhere throughout the year there has been a deficiency. The prospects of the future are now hopeful, but shortage must remain, and its consequences be felt for a long time. Happily the lack of labour has not been equally intense everywhere, Matabeleland having suffered less than Mashonaland, and outlying districts like Victoria, Melsetter and Inyanga less than the more densely occupied central portions of the Territory.

The number of cattle given by the census returns is 463,923: 287,410 in Mashonaland and 176,513 in Matabeleland. In seven years, since last census, the percentage of increase is 264, and the rate is constantly accelerating. It will still, however, be many years before the country can be regarded as fully stocked. The native cattle, 299,756, or about two-thirds of the whole, are of little practical account, being in the hands of those who regard their mere possession as wealth, and who in normal seasons have no incentive and little need to convert more than a very small fraction of their increase into other commodities or into money. An instructive fact brought out by the returns is that European-owned cattle have in seven years increased 440 per cent., whilst those of natives have increased 209 per cent., less than half as much. The same is true of sheep—263 per cent. increase for white men's sheep, as against 131 per cent. for those of natives; but the reverse is the case for goats—42 per cent., against 83 per cent., this being a class of stock little favoured by Europeans. Sheep number in all 292,372, of which only 58,341 are owned by Europeans against 234,031 held by natives. The number of goats is given as 601,635, of which only 24,737 are owned by Europeans. Tame ostriches have dwindled since the census of 1904, from 78 to 46. Of the total of 20 105 equines, only 1,977 are possessed by natives, whilst Europeans have 2,333 horses, 10,626 donkeys, 5,169 mules and 56 jennets. One half of the horses and nearly one half of the mules are owned in urban areas. Even in rural districts many of these animals are owned by persons other than farmers, so that they cannot be regarded as entirely an agricultural asset, the less so since the great majority have not been reared in the country, but are imported.

In view of the consideration given during the year to the prospects of swine husbandry in Rhodesia, the census returns with regard to pigs deserves attention. The total number owned by Europeans is 10,801, no count being taken of those owned by natives, which may be regarded as not suitable and not available for European consumption. The above-mentioned farm pigs go to supply local requirements, though quite inadequately, as is testified by the fact of the importations during 1911 of bacon, hams, pork and lard amounting to 608,975 lbs., valued for Customs purposes at £23,050, an increase over the preceding year. Pigs imported into Rhodesia during 1911, according to Customs returns, numbered 213.

The importations of cattle during 1911 numbered 5,408 head. Of these a few hundred were slaughter oxen from Northern Rhodesia and Mozambique; a certain number were high-class bulls from England and the Cape, but the greater part were two-tooth grade heifers brought from the south to put on to farms. Of the 59,564 sheep and goats recorded as entering the country the great bulk were intended for immediate slaughter, but a number also were for breeding purposes, and an increasing inclination in this direction is observable. Equines are subject on entry to the mallein test to detect glanders, the numbers examined during the year being 1,587 horses, 2,759 mules and 2,785 donkeys.

Rhodesia is essentially a stock country. It would be hard to over-emphasise the pre-eminent importance of the cattle industry as a branch of agriculture. The conditions of the country point strongly to meat as the principal ultimate product to be elaborated off our veld. Dairying, too, no doubt has a bright future, yet primarily beef is to be looked to as our staple export in the world's markets, whilst milk, butter and cheese may chiefly meet the local demand.

Arable farming must rank below stock farming in importance, profitable and useful as it is. Cattle-raising requires more capital and a longer time before profits accrue, but ultimately yields a higher return, whilst crop-growing yields a more regular and an earlier return—a more vital consideration to the newcomer and the man of limited means. Ranching, or at least cattle farming on extensive

lines, is a growing feature, so far with a very promising measure of success. The indigenous native cattle supply the foundation stock, improvement being gradually effected by the introduction of bulls of European breeds. In ordinary practice farmers procure what bulls they can, generally Afrikanders or cross-bred animals containing a certain or uncertain amount of European blood, often Shorthorn or Friesland, but also Hereford, Devon and occasionally even Jersey, Aberdeen Angus, Ayrshire, Red Poll and other breeds. The Government is endeavouring to encourage the systematic improvement of cattle in the country. Apart from veterinary activities for the combating and prevention of outbreaks and the investigation of the nature of diseases of stock, the industry is directly assisted. The importation of pure-bred live stock on behalf of farmers is undertaken both from the Union and from overseas. Steps for the establishment of a stud farm have been taken; legislation on the subject of animals' diseases put through; the registration of brands extended; dipping encouraged; whilst no inconsiderable time is devoted to tendering information and advice on questions relating to live stock.

There is no doubt but that the methods employed in cattle-farming are improving, the most noticeable signs being increased attention to such matters as hay-making for winter use, production of forage and of root crops for stall feeding, the construction of dairies and dipping tanks, better housing, more attention to the care of calves, and perhaps above all fencing. The necessity of kraaling cattle at night, always an admitted evil on many grounds, is beginning to give way owing to the increasing use of fences and to the gradual disappearance of lions, except in outlying parts. Changes in the direction indicated are conspicuous on some of the large ranches in Lomagundi and the farming districts of Goromonzi, Umtali and elsewhere, where cattle now run day and night in camps undisturbed and free, with very obvious advantage as against the primitive custom of herding all day and kraaling at night. The mortality of cattle from casual ailments and accidents is singularly low throughout the country, but particularly so where by avoiding the nightly concentration in kraals an effective protection is afforded against the appearance and spread of contagious disease,

and the conditions of life are otherwise rendered wholesome natural and easy.

The arrangements whereby the Department of Agriculture assists farmers to procure from the Cape and Free State Provinces of the Union cattle, sheep and pigs, and allows repayment on easy terms, has continued to be carried on successfully and at a trifling cost to the Government. All animals are carefully selected and the requirements of the buyers studied. Stock to the value of £1,149 has been purchased during the year, comprising 28 bulls, 8 heifers, 53 sheep, 11 boars, 52 sows and one jack donkey. This is a falling off as compared with last year, and is to be explained by a not unnatural hesitancy on the part of breeders to obtain pure bred stock when Coast Fever was occasioning alarm. The diminution is proportional to the general reduction in the numbers of live stock imported from the south. The total value of stock imported under this scheme since its initiation in September, 1908, is £4,345.

It is universally recognised that the most desirable course for the purpose of improving our herds is the provision of locally bred bulls of pure race, and that this is a proper undertaking for the Government on behalf of farmers; yet until the need can be adequately met by the stud farm the next best course is to import bulls, immunise them so far as possible against the endemic diseases, redwater and gall-sickness, and to distribute them to breeders at actual cost price. On these lines 45 bulls of the Shorthorn, Hereford and Sussex breeds were imported, along with a few others privately procured, inoculated, and sent to farmers all over the Territory. The results of this enterprise, largely experimental, are eminently satisfactory, the mortality being much below what might in the circumstances have been expected. After distribution the animals have been inspected, and in most instances were found to be well cared for, although a few cases of inadequate attention and neglect were found. The success which has attended the venture justifies its repetition. The particular breeds to which attention has been confined are those recommended for special encouragement by Government after a prolonged and spirited discussion of the subject at the annual conference of the Agricultural Union, held at Bulawayo. Whilst there are

many breeds of cattle capable of improving our indigenous stock, it was on that occasion realised that indiscriminate introduction of specimens of all such breeds was not calculated to benefit the future cattle industry of the country so much as the persistent and consistent introduction of a limited number of breeds, whereby uniformity of type would at an earlier date be realised, and to this end Shorthorn, Sussex and Hereford breeds were selected. Subsequently this decision has been criticised on the grounds that all breeds should equally be encouraged and every one experimentally tested.

The advantages to be gained from the encouragement of a limited number of breeds are many and weighty. Primarily the aim is to secure as much uniformity in the type of the future cattle of Rhodesia as possible, an end impossible if at this stage, when the number of cows is still small compared to what it soon will be, many different breeds are introduced. If, as is generally assumed, Rhodesia is one day to be an exporter of beef and of meat products, then for the European markets as well as for freezing and canning factories here, it is highly desirable that as large numbers as possible of carcasses of similar character should be available. This is not possible where many breeds have intermingled, resulting in mongrel stock of nondescript character, not able to breed true to type. There is an idea prevalent that each separate English breed will prove particularly fitted for different classes of veld in Rhodesia. The similarity of native stock over wide areas gives contradiction to this idea, one type having been evolved by the slow processes of natural adaptation. The rival merits of British breeds are hotly contested by their respective supporters. Actually, the change of environment from home pastures to Rhodesian veld outweighs in importance these attributes, but what is essential is that the right stamp of sires, whatever the breed, be procured, and that a breeder, having once introduced foreign blood amongst his native herd, should adhere to that breed and intensify the effect, instead of changing about so that the relative prepotency of the first breed used is lost in conflict with other breeds, and the strongest influence left is that of the original native stock. The great danger of producing nondescript mongrel stock is increased by every additional breed introduced into the country. The fewer the foreign breeds therefore the better, but a certain

range is of course necessary, depending upon the methods of farming followed, whether intensive mixed farming with hand feeding and possibly dairying is practised, or ranching, or any of the manifold intervening degrees of care are pursued. Perhaps there is no commercial British breed but which would improve our native stock, and the practical issue is therefore to use breeds which experience has shewn to do well, and especially such as are already represented in the country in any numbers. In selecting bulls for Rhodesia these points must be borne in mind, but no less important than the breed is the breeding and character of the individuals selected; indeed many consider this the more vitally important point. The main considerations in the selection of bulls for use amongst the ordinary cows found in Rhodesia to-day are constitution and substance, coupled with pedigree, which proves that the animals have been bred true for generations, and therefore possess a marked degree of prepotency. These attributes may be ensured by selecting from reputable sources bulls strongly marked by the characteristics of the breed, correctly proportioned, free from structural defects or irregularities in any part. We want animals particularly well ribbed out and low on the legs, strongly built, wide in the frame, free movers, and not unduly forced, fattened and pampered.

Butter continues to be imported from beyond our boundaries in ever-increasing quantities, the figures for 1911 being 349,384 lbs., valued at £24,056, against in 1910 288,914 lbs., valued at £19,131. It is some consolation to observe that in this commodity the oversea trade appears to be dwindling in favour of South African produce, but there remains the fact that a considerable amount of money is passing out of the country which might well be retained here. Owing to the steady supply and the uniform and reliable character of their produce, the creameries of the south are competing successfully against our farmers at our doors, a condition of affairs which cannot be allowed to continue. It is hoped that the appointment of an expert specially charged with the encouragement of the live stock industry, including dairying, will rapidly lead to changes in this direction.

In the early part of the year, at a special session of the Legislative Council, summoned for that purpose, an Ordinance

was brought in and passed, amending the existing Animals' Diseases Ordinance of 1904. The recrudescence of African Coast Fever amongst cattle, which had unfortunately manifested itself, demanded the application of prompt and effective measures for its suppression. The conditions of earlier years no longer held good. The number of cattle in the country was enormously greater than it was when African Coast Fever first appeared, the herds were much closer together, and their grazing grounds, unless fenced in, overlapped to a much greater extent than formerly. Especially was this the case round centres of population, rendering suppression of disease in the neighbourhood of our towns a complicated and difficult task. To meet the altered conditions additional powers were required. Promptitude in the erection of fences is essential to success, and to fight the disease provision was made in the new law for the erection by the Government of fences and dipping tanks wherever necessary, at the public expense, but recoverable over a period of years from the adjoining proprietors where such fences run along the boundaries of farms, and in the case of tanks from the farmer concerned. The question had received prolonged public consideration, and the Ordinance is largely framed on the recommendations of a Public Committee of Enquiry, the appointment of which was resolved upon during the previous session. At the same time the opportunity was taken of introducing certain minor improvements in the existing law which experience had shewn to be desirable. In the subsequent ordinary session of the Council a further Ordinance on the same subject, amending a textual omission, was passed. The application of the provisions of this law has materially facilitated the suppression of Coast Fever. Fencing and dipping are the proved weapons with which to combat this disease. Both together are essential; and, whilst the cost is high, it is always to be remembered that tanks and fences are permanent improvements, and of value wherever erected. Dipping is of recognised value for the suppression of all tick-borne diseases and for the destruction of ticks, which, even if they did not convey sickness, are in themselves a debilitating scourge well worth exterminating. The value of fencing too, for ordinary farm purposes, it is hard to exaggerate; at a low estimate the grazing capabilities of properly fenced land is raised by

one-third, whilst the whole management of an enclosed farm is revolutionised. Probably no one factor is of more far-reaching beneficial effect on the farming of the country than an adequate and general extension of the practice of fencing.

The policy of encouraging dipping as a means of eradicating ticks, and so combating tick-borne disease, has been energetically pursued. More particularly has the encouragement of private dipping tanks received attention in preference to the erection of public tanks. It is realised that by having a tank on his own land the farmer is in a position to defy disease by regular periodical dipping of all his stock. Helpful as public tanks are at certain points, yet to use them necessitates the movement of stock at frequent and regular intervals some distance to one central point. To this end cattle usually have to traverse several farms and travel by the same routes, concentrating at one point stock from all quarters, an undesirable contingency wherein danger of infection exists. In ordinary circumstances public dipping tanks only serve trek oxen or cattle entering or leaving a district, and do not benefit the main herds of breeding stock. Grants in aid of dipping tanks to the extent of £2,338 were made. The number of tanks in use or under construction in Rhodesia at the end of 1911 was 215, of which 25 are public tanks and 190 private. There has been a notable advance in the use of tanks during the year, and every prospect of further increase in this very desirable direction, for which there is also much room, as the number of those who possess tanks is but a small proportion of the farmers in the country, and the great mass of native cattle are still unreachd.

With regard to the application of that portion of the fencing law by which neighbours can be compelled to share in the cost of boundary fences, the principle of local option exists. During the year farmers in the districts of Gwelo and Bulalima-Mangwe have in this way taken advantage of the provisions of the law, extending it to over 6,224 square miles. The growth in public favour of this measure may be gauged by the areas under its operation during the past three years:

1909	...	...	870 square miles
1910	...	...	2,523 " "
1911	...	...	8,747 " "

Complaints have been frequent regarding damage done by elephants, and patrols of police have been despatched to endeavour to induce them to leave the vicinity of farms and retire to unoccupied lands, where they may remain undisturbed. To this end only old bulls are being shot. Hippopotami in the Zambesi near the Victoria Falls are also to be regarded as a growing danger, and the question of systematically dealing with them has been under consideration. The larger buck interfere not a little with the farmer in certain parts, whilst elsewhere the illicit and wholesale destruction of game, where they are doing no harm at all, is reported. These and kindred matters are receiving the attention of the Administration.

Extracts from the Report of the Chief Veterinary Surgeon.

FOR THE YEAR ENDED 31ST DECEMBER, 1911.

African Coast Fever.—The following table shows approximately the mortality, inclusive of animals destroyed on rise of temperature, during the last two years, with the number of cattle in the infected herds :—

		1910.	1911.	No. of Cattle involved both years
Bulawayo	}	...	153	429
Umzingwani				
Matobo				
Bubi				
Salisbury	...	24	2	880
Makoni	}	...	166	361
Inyanga				
Umtali	...	—	2	—
Melsetter	...	4	242	310

Whilst there has been a large increase in the number of outbreaks during the year, and in the mortality, all the infected herds were in most cases satisfactorily dealt with, the infection being quickly eliminated with small loss to the owners. Of the total loss above shewn more than half occurred in six herds or kraals; this was due to the disease having been in existence for some time previous to having been reported, resulting in a large number of cattle and large tracts of veld being infected before any attempt could be made to eliminate the disease by passing the animals through temperature camps.

Greater difficulty was experienced in dealing with infected herds than during the preceding years, owing to the large increase in the numbers of cattle in the various districts and the restricted amount of veld available for temperature camps. In some cases—*e.g.*, Bulawayo and Umtali Commonages—it was found impracticable to move the cattle to clean veld, and

recourse was had to the system of three-day dipping, recommended by the Government Bacteriologist of Natal as the result of his valuable investigations on dipping and tick-destroying agents. Our results are so far most satisfactory, and the practice promises to simplify the methods of dealing with Coast Fever, with a minimum of loss and inconvenience to the owner, and without removing the cattle from the infected veld; in fact, by keeping the cattle on the infected veld the infected ticks will be destroyed quicker than by any other measure, and the danger of the disease being carried to other centres lessened. Not only is three-day dipping a valuable method of dealing with infected herds and infected veld, but it also promises to be the best means of preventing the spread of the disease to clean herds.

Notwithstanding the somewhat alarming extension of the disease during the last twelve months, the various outbreaks have been well controlled and the infected herds in most cases cleansed with small loss. No doubt we shall have further outbreaks before the disease is finally eradicated, but the cattle-owner who has his cattle within a fence and dips them regularly need not, in my opinion, fear Coast Fever.

A large number of tanks have been erected in the Bulawayo, Umzingwani and Matobo districts, and most of the cattle near the infected centres are being regularly dipped.

In my last report I referred to the difficulty which occurred in some cases of making an accurate diagnosis in the first cases of Coast Fever in a herd, owing to the absence of definite *post-mortem* appearances and the absence of piroplasma and Koch's bodies in the blood, spleen and gland smears. I also referred to a sub-acute form of the disease where no distinct rise of temperature is shewn, which prevented in some cases the successful elimination of infection by the temperature camp method. In connection with the former I would draw attention to the two cases already referred to, which occurred at Messrs. McChlery's farm, Salisbury district, where Koch's bodies were found on one occasion only in each, the animals quickly recovering from their slight indisposition in two to three days. Referring to this, the Government Veterinary Bacteriologist states: "In other cases where undoubted *piroplasma parva* have been found, they have

disappeared for several weeks, to re-appear with an acute form of the disease, from which the animals succumbed." The outbreak on Umtali Commonage, where Koch's bodies were found in smears from a calf which died in January, with no further evidence of the disease until the following December, when a similar case occurred in an adjoining herd, shews that infection may exist on any given area for a very considerable period without resulting in an extensive outbreak. These facts force one to the conclusion that we have yet a good deal to learn about the etiology of Coast Fever. The Government Veterinary Bacteriologist holds similar views. He states; "The discovery of Koch's bodies in calves grazing on areas considered to be free from Coast Fever and among animals apparently healthy has opened up a new aspect of the etiology of this disease." No doubt further investigation will shed some light on these points, and furnish an explanation of the cause of several outbreaks during the last four years, which we have been unable to connect with any known area of infection.

Plasmoses of Cattle.—This term includes the diseases commonly known as redwater and gall-sickness, which all susceptible animals contract when exposed to veld infection in this country. Locally-bred stock do not suffer from either disease to any great extent, or rather they become immune when young without serious indisposition, but they are of the greatest importance in view of the increased importation of well-bred susceptible stock from overseas. A considerable amount of attention has, therefore, been paid to these diseases by the Government Veterinary Bacteriologist, as will be seen from his reports, and a series of experiments have been performed by him in order to obtain, if possible, a modified virus, whereby susceptible stock could be rendered immune before exposure to natural veld infection.

An animal was obtained from the Government Bacteriologist, Transvaal, which had been infected with *Babesia bigemina* (the organism which causes redwater), and a pure strain of the *Anaplasma centrale*, a variety of *Anaplasma marginale*, which causes gall-sickness. Material from this animal was used for the inoculation of a consignment of 67 English-bred bulls and heifers which arrived in Salisbury

in July, 1911. Full particulars in regard to the inoculation of these animals have been furnished by Mr. Bevan. On the whole, the results may so far be considered satisfactory, but they leave something to be desired, as several of the animals have, since exposure to natural infection on the veld, contracted a virulent form of gall-sickness, from which four have died. Mr. Bevan states: "It now remains to be shewn by careful experiment and observation whether—

- "(1) the virus from the Transvaal animal has died out;
- "(2) whether it has lost its power of conferring immunity;
- "(3) whether it confers immunity against local strains of virus;
- "(4) whether it is not desirable to fortify animals immunised with this virus against a polyvalent local strain before submitting them to natural Rhodesian infection;
- "(5) whether the breakdown of immunised animals is due to infection with *Anaplasma marginale* alone, or other complicating causes."

Further experiments are being made on these lines, and it is hoped to obtain information which will be of value in inoculating the pure-bred stock to be imported from England during the current year.

Black Quarter or Quarter Evil.—Two outbreaks of this disease, which had not been previously recorded in Rhodesia, occurred at centres widely apart in Matabeleland, and 17 animals succumbed. It appears that during the 12 months preceding the outbreak about 40 animals had died from what was thought to be snake-bite; it is evident, therefore, that the infection existed for a considerable period before it was reported. The mortality ceased early in July, since when the farms have remained in quarantine. From the commencement the Veterinary Surgeons investigating the disease in the field—Messrs. Edmonds and Hooper Sharpe—were struck with several unusual features, and expressed a doubt as to whether they were dealing with black quarter *per se*, or a local form modified maybe by environment or other undetermined cause.

The usual characteristics to which they called attention were:—

- (1) the time of year when the disease occurred (late autumn and early winter);
- (2) the age of animals affected (no affected animals were less than 18 months old);
- (3) the susceptibility of horses and donkeys;
- (4) the frequent absence of emphysema in the affected muscles and the unusual surface appearance of the lesions.

There does not, however, appear to be any satisfactory evidence that equines naturally contracted the disease which was affecting the cattle. Both centres are noted for snakes, and the suspicious cases which occurred in equines may have been due to snake-bite. This doubt as to the exact nature of the disease resulted in: (1) no steps being taken in regard to inoculating the cattle on the infected farms, and (2) laboratory investigations with material from affected beasts. The Government Veterinary Bacteriologist has submitted a full report of his investigations and observations, and from this I have no hesitation in expressing the opinion that the disease was black quarter.

Contagious Pleuro-Pneumonia (Lung-Sickness).— We still remain free from this scourge, but owing to the large number of cattle illicitly introduced from the Bechuanaland Protectorate and the Tati Concessions I shall not be surprised if the disease appears in Matabeleland.

Importation of Stock.—The following animals were imported during the year:—

CATTLE.

From Great Britain	...	88 bulls	2 heifers
„ Cape and Orange Free State	155	„	3,217
„ Portuguese East Africa	...	356 (slaughter)	„
„ North-East Rhodesia	...	1,146 (mixed)	„
„ North-West Rhodesia	...	155	„
Horses	...	...	1,587
Mules	...	...	2,759
Donkeys	...	...	2,785
Pigs	...	...	304
Sheep and Goats	...	...	59,564

Except a few cases of trypanosomiasis amongst the cattle imported from North-Eastern Rhodesia, no disease was detected amongst the cattle and small stock. Disease amongst imported equines will be referred to under glanders.

Glanders.—Two outbreaks occurred—one at Salisbury and the other at Gwanda. Four animals shewing visible symptoms of the disease were destroyed. All “in contacts” were tested with mallein. Two re-acted and were destroyed.

All the imported horses, mules and donkeys were tested with mallein on arrival. Two re-acted and were destroyed. Compared with previous years—in 1910, 17 re-acters were destroyed—this is a very satisfactory decrease, and shows that the disease is less prevalent in South Africa.

Rabies.—I regret to have to report a serious increase in the number of cases of rabies reported. Outbreaks occurred in the following districts:—Victoria, Chibi, Ndanga, Selukwe, Gwelo and Charter, and the regulations, which include provision for the enclosure or chaining-up of all dogs for at least six weeks when an outbreak occurs, were enforced in these districts or portions thereof for periods varying from six weeks to six months. It is impossible to furnish any reliable information as to the number of animals actually affected with the disease. Many animals are destroyed on suspicion, and in most cases it is impossible to make experimental inoculation at the laboratory, because material from outlying districts generally arrives in a putrid condition.

Horse-Sickness.—During the year 1,373 mules were inoculated with serum and virus supplied by Dr. Theiler. The number of deaths attributable to the inoculation was 43.

Trypanosomiasis.—Only a few cases of this disease occurred, in the districts of Hartley, Lomagundi and Mafungabusi, which contain various areas in which the tsetse fly exists. In one instance only did the disease affect solipeds, viz., two mules in a span which passed through a narrow fly-belt in the Lomagundi district. A virulent form of the disease appeared amongst pigs on a farm in the Hartley district. The investigations which were being conducted by the Government Veterinary Bacteriologist into the nature of local types of this disease had to be discontinued in favour of more urgent work.

Farms and Farming in Rhodesia.

THE HARTLEY DISTRICT.

By H. GODFREY MUNDY, F.L.S., Government
Agriculturist and Botanist.

The Hartley district occupies the northern centre of Southern Rhodesia, and is adjoined on the south by the Gwelo and Charter districts and on the north by the Lomagundi and Salisbury districts. The actual boundaries as defined in the *Government Gazette* are as follows:—On the west by a line drawn from the junction of the Umniati and Umfuli rivers in a south-easterly direction along the boundaries of the Lomagundi district to the Hunyani river; then easterly up the Hunyani river to its intersection by the old Salisbury-Charter-Victoria road; thence in a southerly direction along that road to its intersection with the Ngezi river; thence westwards down the Ngezi to its junction with the Umniati river, and thence down the Umniati until it joins the Umfuli.

The district comprises an area of 6,190 square miles or approximately 3,961,600 acres, and is roughly bisected by the railway line which enters at Umsweswe Siding and leaves in the north at Norton Siding. It is thus well served by the railway, and in addition has the advantage of possessing several more or less important consuming centres such as Hartley, Gatooma and the Eiffel Flats, and Gadzema, which afford markets for farm produce and are the bases from which a considerable amount of transport riding is done.

The mining activities of the Hartley district are well known, and the numerous mines, both small and large, afford markets for farm produce which are not equalled elsewhere in Rhodesia. Among the more important thus available may be mentioned the Giant Mine at Gadzema, the Cam and Motor and others on the Eiffel Flats, those in the neighbourhood of Concession Hill, south-east of Hartley, and those in the

vicinity of the Golden Valley and Shagari, about thirty miles west of Hartley. Many other properties of varying size are also being worked, and forming centres around which the more recently occupied farms are clustered.

The most recent statistics place the number of farmers (plot holders not included) in the district at about ninety. Four Farmers' Associations are to be found, one, the oldest established, at Hartley, and three, more recently formed, at Gatooma, Makwiro and Norton respectively. The distribution of these centres may be taken as a rough guide to the present settlement of the district.

Several rivers, large for Rhodesia, intersect the Hartley district, running for the most part from east to west, and thus indicating the general lie of the country. Chief among these are the Umsweswe, the Umfuli and the Hunyani; also the Sirundazi, the Zimbo, the Nyarakuru, the Serui and the Suri-Suri. Without exception these rivers flow between deep banks and whereas during the rainy season they are often raging torrents many yards wide, during the present year with its almost unprecedented drought they form but a series of pools stretching across the country, the flow between which more often than not pursues its course beneath the sand of the river bed. For this reason and even in favourable seasons, direct furrow irrigation becomes a difficulty, but many good irrigation schemes can be obtained by pumping water from the pools on to land along the river banks. Possibilities of this sort of irrigation are to be found on such farms as Borden, Donnington, Corleynor and others. On Corleynor, Messrs. Burrows & Lealy have for some years carried on irrigation by pumping from pools in the river, and it is understood that the scheme is being extended, while already on Mr. Woodford's farm, Lantegloss, a bore hole and steam engine is pumping water on to a few acres of red land utilised for vegetable gardening and lucerne. Bore holes which under favourable conditions could probably be used for irrigating small acreages are also found on Mr. Charter's farm near Gatooma, and on Messrs. Webb & Somerset's ranch, Doweras. Mr. Leonard on Sabonabon, has constructed a small storage dam, while on Mr. Woodford's second farm an excellent site for a large dam with abundance of good land below it, is found. On Messrs.

Campion Bros. farm the water supply in a disused shaft is now being raised by means of a bucket pump, and an extension of these operations is proposed. On Mr. Thompson's farm, Chivy Chase, water for domestic purposes is being cheaply and effectively pumped from a well by means of a small New Way Oil Engine.

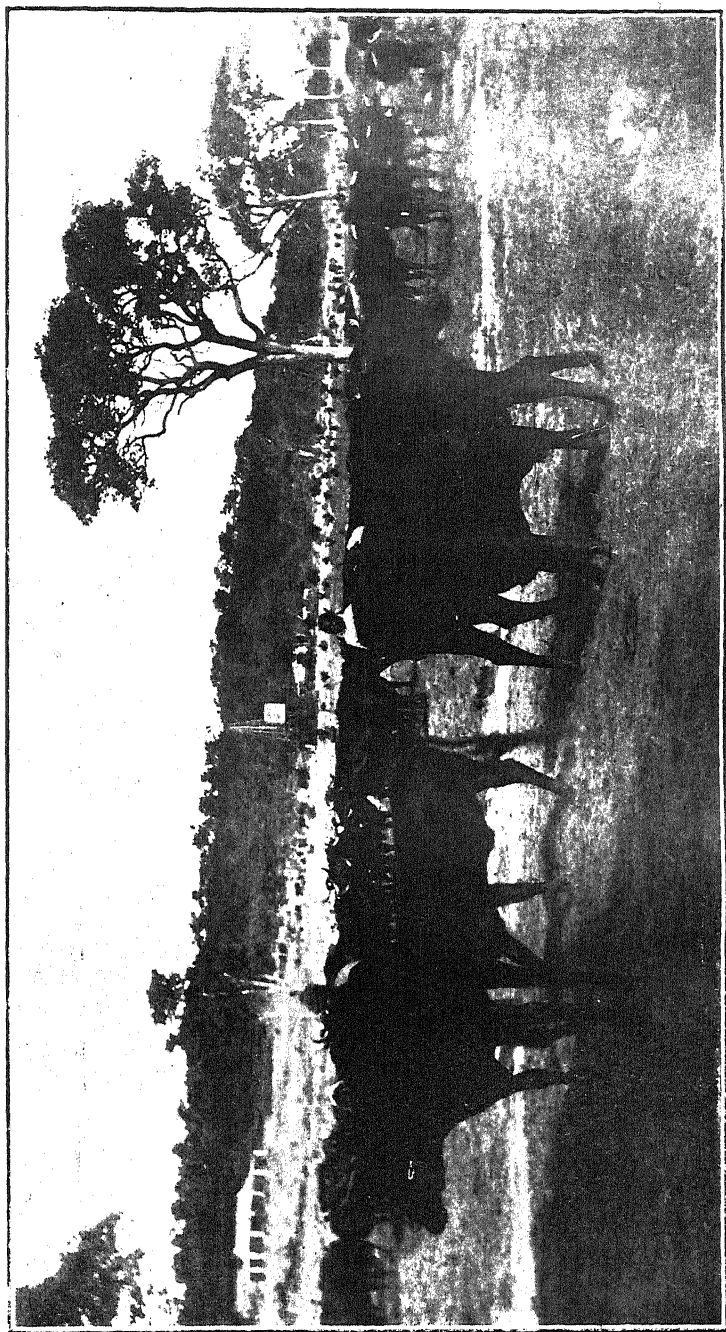
One of the main drawbacks of the district from the settler's point of view is the dense and for the most part worthless bush, which covers a large part of the country. Unlike many other districts, in Hartley much of the best land is bush-covered and can not be brought under the plough without a deal of labour and considerable expense in clearing and stumping. Several farmers, including Mr. Thomas, of Gatooma, and Mr. Cutler, of Hartley, have endeavoured to do this work by means of mechanical contrivances, but the general consensus of opinion appears to be that with our Rhodesian trees, and especially during the dry season, stumping machinery is to a great extent ineffective.

The second and more serious disadvantage under which the district labours is the presence of tsetse fly in certain localities. The most important "fly-belt" is that of which the centre may be said to be the upper basin of the Suri-Suri river and its tributaries. The belt does not seem to extend as far north as the Golden Valley-Suri-Suri road, as cattle work freely between the crowded mines along the road, and no cases of 'fly' disease has been traced to this part during the past five years. Five years ago a few cases occurred at the Mabel's Luck Mine. On the other hand 'fly' turns up at odd times all along the watershed in the vicinity of the railway line between the Umfuli river and Gatooma. The north bank of the Umfuli seems to be the outermost boundary to which 'fly' may be carried on the one hand, and the southern bank of the Umsweswe river on the other. North of Gatooma the belt extends a little to the south-eastern side of the railway line. South of Gatooma cattle have been 'struck' as far east as the vicinity of the Lydia. Although the limits mentioned roughly enclose the "fly area" or the area in which animals have been struck in recent years, 'fly' is rarely seen except about the upper Suri-Suri basin and even there the numbers are very small. During the past four years the 'fly' has decreased greatly in numbers.

There are also numerous belts in the extreme north of the district about the lower basins of the Yabongwe and Sakugwe rivers and along the banks of the Umniati as far south as Gowe's kraal. The 'fly' in these parts is much more plentiful than about the Suri-Suri.

As the reports of early hunters and explorers indicate that tsetse was found before the rinderpest as far east as the Mashaba and Hartley Hills, we may congratulate ourselves that the situation as regards this pest is greatly improved.

The soils of the Hartley district are many and varied, and may be said to embrace all types, with the exception of those derived from sandstone, found elsewhere in Southern Rhodesia. Heavy black vlei soil is abundant in the Makwiro section, and to a more limited extent in the vicinity of Concession Hill and the Eiffel Flats. Granite sand veld, of the poorer type, is to be found in the extreme south, east, west and north of the district, and also in the neighbourhood of Gadzema, while red loam soils, in belts of varying magnitude, and derived from diorite and ironstone ranges, intersect the district in all directions. Hartley district is thus essentially well suited to mixed farming, and its prospects as a dairying centre are of the best. The black soil, of the Makwiro section in particular, shews features of interest not frequently met with in other parts of Rhodesia, namely, the presence of large quantities of what is apparently water worn iron-stone rubble of varying size. In some valleys these stones virtually cover the surface of the ground and add not a little to the difficulty of ploughing, though the soil beneath is of exceptional fertility and yields excellent crops of maize. The red soils appear to be for the most part of normal fertility, and not so inclined to cake and turn up in hard lumps, as similar soils in the Salisbury and Mazoe districts. The sand veld, as has been said, is of rather a poor quality, and, except around Norton, appears to lack that power of retaining moisture which is so noticeable in granite sands in other districts. No small part of the district is also occupied by mopani veld—the farmers' *bête noire*. All that can be said at present of this class of veld is that it is better left alone. During parts of the rainy season it affords moderately good grazing, but in the height of the rains it is too soggy, and as the dry season advances, the herbage



Cattle on Mr. Woodeforde's Farm, "Lanteglos." Citrus Orchard and Residence in the background.

quickly dries off and becomes unpalatable. For arable farming the Mopani veld is generally useless unless large quantities of kraal manure can be applied. Such soil is close, sticky, and extremely hard to plough, and appears to owe its poor cropping characteristics more to its undesirable physical qualities than to actual infertility. It is a soil essentially unfavourable to the existence of aerobic bacteria, or in other words some of the bacteria most useful in maintaining the fertility of our soils. Little is at present known regarding the best treatment of Mopani soils, and fortunately few farms are situated entirely on this class of land. There seems no doubt, however, that what is most needed with such soil is deep ploughing, and if possible sub-soiling, coupled with liming and the ploughing under of organic matter, such as green crops or fresh kraal manure. The felling and burning of scrub on these soils, as a preparatory measure, is also of importance, as a means of supplying to some extent the mineral requirements.

As far as cattle are concerned, the Hartley district is rather backward when one considers the number of farmers resident therein. With but few exceptions, the breeding stock are purely of native origin, and anything in the nature of well-bred bulls is conspicuously absent. A noticeable exception, however, is the pedigree Hereford bull "Peerless," bred by H.M. the late King Edward VII., and now the property of Mr. J. Mack, of Gatooma. When recently seen, this fine animal was in prime fettle, and his owner is to be congratulated on possessing a Hereford sire with few, if any, equals in South Africa, and which cannot fail to leave his impress on the stock of the district. Graded milch cattle of a useful stamp are to be found on the farms Just Right, Lantegloss and Garthenor. The reason that the bulk of the cattle are but little superior to the kafir beast is that the majority of the farmers have, perhaps wisely, relied for immediate returns upon arable farming, in a locality so essentially suited to it. Apart from quality, the number of breeding cattle in the district is not, however, disproportionate to a "mixed" farming locality, being approximately twenty head per occupied farm, or in all about 1,700, though nearly half of this total number are found to be distributed amongst three owners. The draught oxen, including yearlings and two-year-olds, number approximately 2,400. Many of the

more recently occupied farms, or those in the vicinity of suspected "fly" country, possess practically no breeding stock, but this is a state of affairs which will soon be altered, and nothing is calculated to bring this about more rapidly than the opening of the proposed creamery at Gwelo. The district is particularly well suited to dairying, many of the railway farms are already occupied, and the distance between the Hartley forwarding centres and Gwelo is so small, and the railway service so frequent, that it should be possible to send cream to Gwelo in the best possible condition.

Already farmers contiguous to a market are doing a certain amount of dairying, and foremost amongst these may be mentioned Mr. Woodford, of Lantegloss, Messrs. Champion Bros., of Hope Farm, Mr. Charter, of Gatooma, and Mr. Savory, of Hartley, who are supplying the centres in their immediate vicinity.

Horses, mules and donkeys are not owned by farmers in any large numbers, the totals as shewn by recent statistics being eleven, twenty-seven and eighty-eight respectively. This is accounted for to a great extent by the fact that horse-sickness is very prevalent in the district, while the bicycle frequently replaces the equine as a means of rapid transport.

The character of the veld does not at present lend itself well to sheep farming, and there appears to be only approximately 1,100 head of sheep and goats owned by Europeans in the district. The veld is as yet too rank to afford good sheep pasturage, and the presence of so much bush, and in parts vermin, add greatly to the difficulty of herding. Goats do well, and it is remarkable that those farmers without cattle do not keep a few milch goats and so avoid the use of "tinned-cow." A fear is sometimes expressed that the use of goats milk in Rhodesia may give rise to Malta Fever. The Medical Director, however, has expressed the opinion that this danger is only likely to be serious with imported goats,—the local native goats are not known to convey the disease, and in any case by raising the milk to a temperature to 60 degrees C. for twenty minutes, all danger of transmission can be obviated. It would be of interest to see an experiment conducted with Angora goats in the Hartley district. Cross-bred goats with Angora blood appear to do well, and there is reason to believe that in the less densely

wooded parts of the district, Angora goat farming might be profitable.

The present season is not a good one in which to judge the support which the bacon factory is likely to receive. Recent returns place the total number of pigs in the Hartley district at about 300, at least one third of which are probably sows. Owing, however, to the high price of maize and the light yield which many farms will this year afford, several farmers have been disposing of their pigs, while others have made arrangements to board them out, their keep being supplied in return for a certain proportion of the progeny. Judging by the number of wild pig found in the district, and incidentally their well known powers of converting maize into pork, the district should be well suited to the domestic pig. Pig paddocks containing both shade and water can in most parts be easily provided, while many of the common native trees, such as M'hash, Masuma and others yield wild fruit of good fattening value and much relished by pigs.

Mr. Frederick Swarder, of bee fame, has made his home in the district, and is doing much to stimulate interest in bee keeping. Hallingbury honey is usually to be obtained in Hartley township, and leaves little to be desired as regards quality. Mr. Swarder, however, finds that the native Rhodesian bee is very wild, and is not so reliable a honey gatherer as the Transvaal bee. The introduction of Italian queens has been found enormously to improve the strain, and it is to be hoped that this will receive the attention of Rhodesian apiarists. There is undoubtedly good money to be made out of bee-keeping in Rhodesia, and Mr. Swarder, who contributes regularly to the *Journal* on the subject, is always willing to give the novice the benefit of his own wide experience.

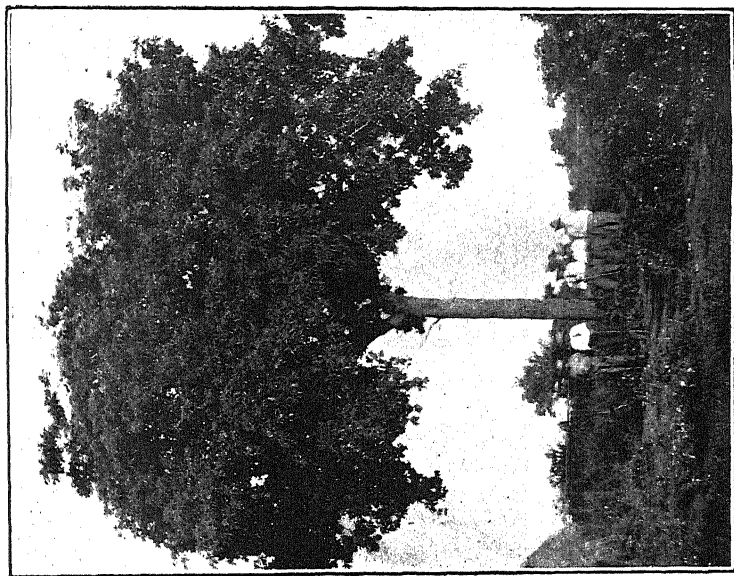
Poultry are not kept in very large numbers, and about 2,000 seem to be the total number for the district. Messrs. Swarder Bros., and Mr. Cutler have devoted a good deal of time to poultry raising, but vermin have proved troublesome and disease has made its appearance as the number of birds increased.

Maize growing is by far the most important side of arable farming, and in this respect statistics are of great interest.

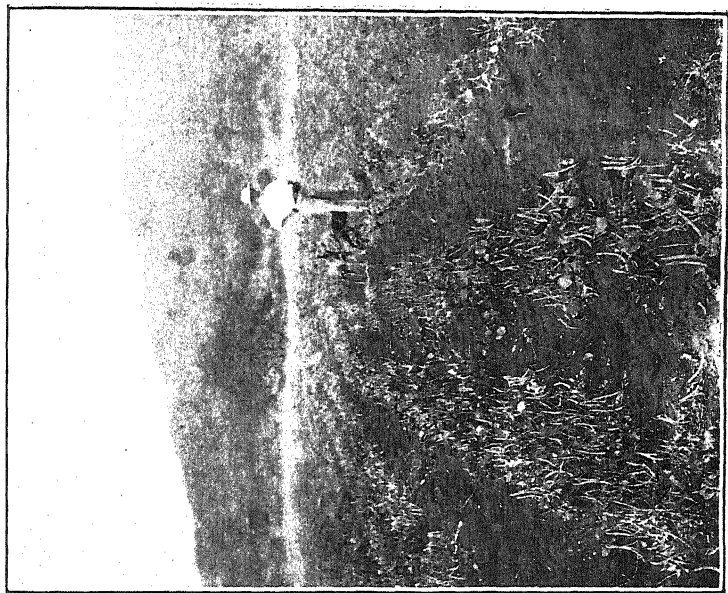
These statistics, some of which were collected early in 1911, are not absolutely accurate, yet, nevertheless they form a sufficient guide for an approximation. The area planted to maize is roughly 6,400 acres, while the total acreage occupied by other crops, including fruit trees, is about 550 acres. In other words, the occupied farms have an average of approximately 71 acres of maize and six of all other crops. The urgent need of some form of rotation and of additional crops which may replace maize at once becomes apparent, since under existing conditions less than one twelfth of the annual acreage is planted to a change crop. Presuming in the present season the average yield of maize to be $4\frac{1}{2}$ bags per acre, the Hartley district should produce about twenty-nine thousand bags of maize, or roughly one fourteenth of the total production of Southern Rhodesia. This is a somewhat remarkable fact, and clearly indicates the importance of local mines as a market, since Hartley is not usually looked upon as a centre from which any large supply of maize is to be expected to meet outside requirements. It is possible that owing to shortage of labour and an unfavourable season the total production will not quite equal the estimate, but it is evident that under favourable conditions the district might double, if not treble this output, even with its present settlement: the average fertility of the soil justifying a much higher yield than $4\frac{1}{2}$ bags per acre.

In a district where the preponderance of maize to other crops is in a ratio of 12 to 1, it is needless to look for anything sensational among the auxiliary crops. Statistics available indicate the following acreages:—Tobacco 200, beans 56, sweet potatoes 54, oats 49, potatoes 40, pumpkins and melons 40, wheat 33, manna 16, velvet beans 9, ground-nuts 9, barley 7, kafir corn 7, mangels, linseed, cotton and other fibre crops, etc., 20. Between twenty and thirty acres are devoted to vegetable gardening, mostly under irrigation, and with the object of supplying vegetables to the inhabitants of Gatooma, Hartley, the Eiffel Flats and Gadzema, and also for the natives employed on the mines.

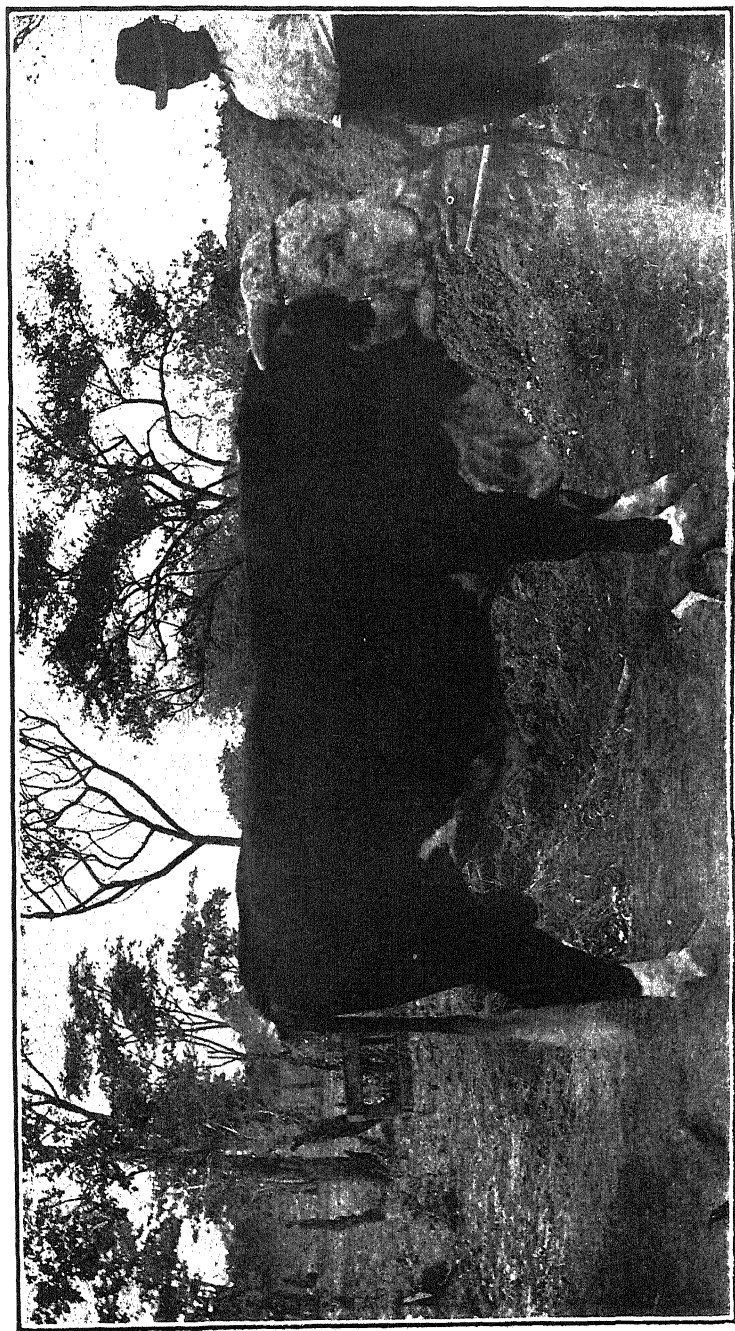
Tobacco is mainly grown in the sand veld section around Norton Siding and Makwiro. The largest growers include Messrs. Hurst & Rolfe, Mr. Bryan on Kent, Mr. McClelland of



A fine specimen of Rhodesia Yellow Wood (*Terminatia Servicea*).



Kafir Bean crop on Mr. Tokeley's Farm, "Borden."



Hereford Bull "Peerless," the property of Mr. J. Mack, Gaboma.



Cromdale, and Messrs. W. Cumming, Fraser, Hookham and Gebbie, all more or less in the same locality. Mr. Charter, of Gatooma, has carried out a small experiment this season with tobacco on light red soil, but a poor season, and the fact that no artificial manures were applied, has militated against success. The northern part of the district contains much excellent tobacco soil, and as the granite veld farms are occupied, and a regular labour supply becomes more assured, a big increase in the acreage planted to tobacco should be manifest. In the south-east also, granite formation appears, and here again suitable tobacco soil can be found, though in most cases preparatory clearing and stumping will be necessary.

The production of sweet potatoes and beans is increasing, but the past season has been extremely unfavourable for the latter crop, and yields will be light. Kafir beans are being grown more largely by European farmers than in the past, and Mr. Tokely, of Borden farm, has a good crop of these on about 7 acres. The kafir bean is a very certain crop, its chief drawback being uneven ripening and its prostrate habit of growth. Individual plants show considerable variation in these respects, and farmers, who otherwise favour the crop, would do well to practice a little simple seed selection and to save seed for a breeding plot, from those plants which most closely approach their ideal requirements. Sweet potatoes are being grown quite extensively, and almost every farm possesses a sweet potato plot of varying size. The American variety, recently introduced, produces a tuber much superior to the native one. Amongst the largest growers are Messrs. Burrows & Lealy, Messrs. Sworder Bros. and Mr. Savory. The ordinary potato is not grown very widely, and there is scope for an increased acreage to this crop, as also for ground nuts, which might be grown to advantage on the sand veld farms around Norton and Makwiro. Greater attention is now being devoted to winter wheat and oats, and last season some very promising results were obtained on naturally damp soil by Messrs. Sworder Bros., and by Mr. Leonard of Sabonabon. On the heavy black soils oats grow extremely well, and had the rainfall been normal, some good crops would have been reaped this season by Mr. Thomas, of Troed-y-Bryn, Mr. Leonard and Messrs. Sworder Bros. Mr. Cleveland, on his

farm near Makwiro, has been particularly successful with oats grown without irrigation during the last two seasons. On the granite sand veld, poorly prepared and without manure, Mr. Jannash, of Elstow, manager for Messrs. Hall & Sons, was able to produce Bobs and Gluyas wheat at the rate of 5 and $3\frac{1}{2}$ bags per acre respectively. Many of these soils, however, which in a normal season would remain moist until August, are already in June too dry for sowing, and it is to be feared that this year but little will be done with winter cereals without irrigation. Messrs. Sworder Bros. have demonstrated their faith in these crops by importing a seed drill, and have thus been able to plant deep in moist soil. An experiment of this kind is of great value to neighbouring farmers, and should be watched accordingly.

Mr. Cutler, also in the vicinity of Hartley, is giving a lead with many new crops, and his experiments will be of value not only to his own district, but to the whole country. Amongst the crops he is testing are cotton, fibres, castor oil, rice, almonds, etc. A good deal of interest in cotton was manifest last year, but the season of 1910-11 proved unkind and the same may be said of 1911-12. Mr. Cutler is, we think, the only devotee who remains faithful, and he deserves all encouragement and good luck for his perseverance.

Where water for irrigation is available most farmers have small vegetable gardens, and in many cases these have proved extremely profitable. Mr. Woodford has been able to do the most on these lines, and in addition to producing, has opened a depot in Gatooma where not only his own vegetables but those of other farmers can be sold. This is a move for which too little credit seems to be given; it should benefit both the producer and the consumer, the former as regards market and absence of bad debts, and the latter owing to the advantage of knowing the produce is fresh and has been grown under sanitary conditions. Tomatoes form one of the most important vegetable crops and thrive extraordinarily well. Not only are vegetables grown for the European population but also for consumption on the mines. Mangels, linseed, velvet beans and manna are grown on small acreages by a few farmers, but the total is insignificant except to prove the possibility. The making of

silage and the growing of root crops must receive more attention if the district is to fulfil its dairying possibilities. A sign of progress is the large quantity of hay which has been cut and cured this season. Probably a big proportion of this is designed for sale, but it is not too much to hope that a certain amount of it will be utilised for home feeding. A few years back it was the exception to see veld grass being cut for hay at all; now the practice has become common. The making of hay is the first step in the realisation of the importance of winter feeding. The next is an appreciation of the fact that succulent food is also needed, and given this the making of silage or the growing of root crops will become equally general.

Fruit trees have not yet been established very largely, but this is doubtless due to the fact that so many of the farms are only recently occupied. Several farmers are now preparing to plant citrus trees on a large scale, and there is no doubt that where water is available for irrigation, no sounder farming proposition could be considered. The climate is eminently suited to citrus fruits, and the presence of so much timber facilitates the selection of orchard sites well sheltered from the prevailing winds. In America much is now being talked of so-called "dynamite ploughing," or, in other words, exploding charges of dynamite at depths of from two to six feet in order to break up the subsoil. There is every reason to think that, provided the cost is not excessive, this will be an excellent means of preparing orchard soil. In subsoiling with the plough there is often a danger of bringing up infertile soil in too close proximity to the roots of the crop, but with dynamite this is not probable. In some of the Hartley soils, the subsoil is extremely hard, and may almost be termed a pan. In such cases the use of dynamite will probably be of value in order to loosen the subsoil and make it permeable to the roots of the trees.

Mr. Woodford of Lantegloss possesses the largest citrus orchard in the district, and other growers are Mr. Cutler, Mr. Knight, the Sworder Bros., Mr. Stewart and Mr. Hamshaw. The total number of citrus trees in the district is only about 1,500, and many of these are not yet under irrigation.

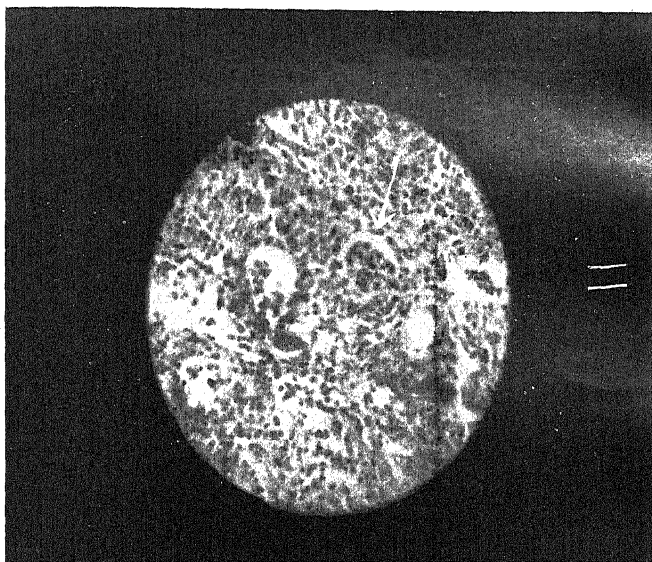
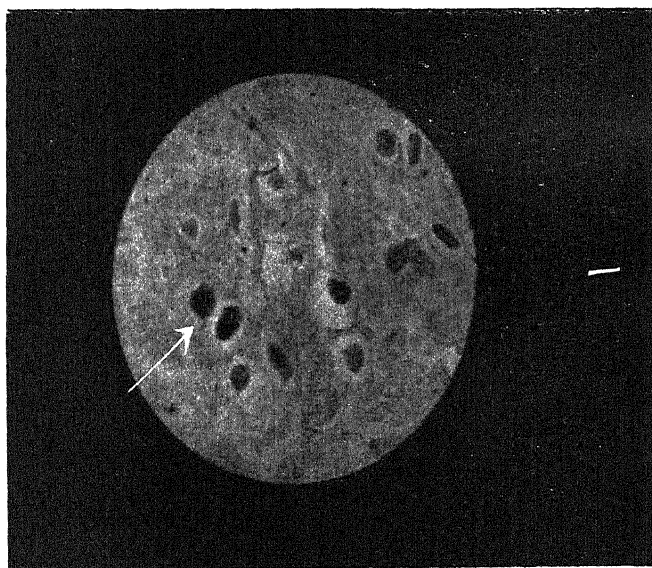
Deciduous fruit trees number about 800 and these, including Japanese plums, peaches, pawpaws, guavas, apricots and mangoes under irrigation might well be increased. Too much emphasis cannot be placed upon the advisability of using really good trees when establishing orchards, and at the present time farmers are far too prone to plant seedling trees. These remarks apply in particular to citrus trees and the short-comings of the "seedling" will become all too obvious when the country reaches an exporting stage.

The native timber of the district is for the most part of inferior quality, but a certain amount of Mashuma (*Diospyros mashuma*), Mahasha (*Parinarium mobola*), Yellow-wood, M'susu and M'konono (*Terminalia spp.*) and (*Combretum spp.*) are found. The Rhodesian Mahogany (*Azelia cuanensis*) and Bouken-hout (*Faurca saligna*) also occur sparingly. The latter is the most durable fencing post available in the district. Fine specimens of Mashuma occur throughout, and particularly on the banks of the Umniati River. This timber is now being worked in the Gatcoma saw mills, and the only pity is that it occurs mainly as individuals and not in belts or groves, since it is one of the best of our Rhodesian timbers. Mopani is found in belts throughout the Hartley district, and supplies a useful timber for building purposes, fences or kraals.

Considering the short time which the majority of the Hartley farms have been occupied, much progress has been made. Many of the farms are now comfortably housed with substantial brick dwellings and other permanent improvements such as bore holes, orchards, stone cattle kraals and paddock fencing are receiving attention. The district as a whole is too good for cattle ranching, while considerable tracts of it are not sufficiently good for pure arable farming. The *via media* is mixed farming combined with dairying, and owing to its central position between the main consuming centres and also to the presence of so considerable a mining population, the Hartley district from this standpoint should have before it a great future.



Dog suffering from "Dumb " Rabies, shewing the condition known as "drop-jaw.



MICROPHOTOGRAPHS OF THE PLEXIFORM GANGLION

1. Of a healthy Dog.
2. Of a Rabid Dog.

The cells marked with an arrow in No. 1 have been replaced by round cells in No. 2, the clear spaces being surrounded by proliferating cells.

Rabies.

By LL. E. W. BEVAN, M.R.C.V.S.,
Government Veterinary Bacteriologist,
and T. G. MILLINGTON, M.R.C.V.S., D.V.H.

Cases of rabies having occurred in various parts of Rhodesia, it may be useful to publish for general information some particulars concerning this much dreaded and very dangerous disease.

ANIMALS SUSCEPTIBLE.

Although rabies occurs chiefly in dogs, it may effect any of the higher animals.

In Rhodesia cases have been met with in cattle, horses, mules and donkeys, but other animals, such as the jackal, hyæna, cat, leopard, monkey and in short all those dependent on their teeth as weapons of offence are subject to the disease.

THE CAUSE OF RABIES.

Rabies is probably due to a micro-organism, but the actual cause has not been satisfactorily determined even by the highest power of the modern microscope.

The animal body is absolutely essential to its development, and the nervous system appears to offer the most favourable medium for the growth of the virus. The organism appears to travel from the seat of inoculation by way of the nerves to the brain; so that the danger of infection from a bite is relative to the proximity of the wound to the brain. Thus, the period of incubation of rabies varies. In ordinary cases the minimum period between the act of infection and the onset of symptoms is about six weeks to three months, but there are authentic cases in which it has extended to years.

The virus is also present in the saliva of an infected animal, even several days (3 or 4) before symptoms are manifest. It has also been found in the milk and urine; but is only sparingly present in the blood, muscles and other body tissues.

SYMPTOMS.

The symptoms essentially depend upon derangement of the nervous system, resulting in change of behaviour.

At first the animal may appear dull and morose, or restless and irritable. An affectionate animal may become aggressive, and a savage dog more affectionate than usual. These symptoms may merge into one of two phases, that is to say :

(a) *Furious Rabies*, characterised by extreme restlessness and tendency to wander long distances. A morbid desire to bite, the animal at first snapping aimlessly, and, later, aggressively attacking everything attracting its attention, even biting itself and foreign bodies, such as stones, iron and sticks. This eventually terminates in paralysis and death.

(b) *Dumb Rabies*, the term given to the disease when symptoms of paralysis follow the early stages without the aggressive symptoms becoming manifest. In such cases difficulty in swallowing is an early symptom, so that the owner is often led to suspect that the animal may have *a bone in its throat*. As this symptom progresses all power over the jaw and tongue is lost and the condition well described as "drop-jaw" results. Saliva pours from the mouth, and the animal, although hungry, is unable to feed. It appears anxious and worried and quite conscious of its hopeless condition. This form of the disease, like the furious form, terminates in complete paralysis and death.

METHOD OF INFECTION.

Rabies does not develop spontaneously in any animal, but is always the result of inoculation from some other infected beast. The inoculation may be by means of the bite of an infected animal, or by the introduction of the virus into a wound.

HOW TO DETECT THE DISEASE.

- (a) By the symptoms of the suspected animal.
- (b) By the behaviour of animals known to have been bitten by one suspected to be rabid.
- (c) By expert examination of the dead animal at the Veterinary Laboratory where a diagnosis may be based upon
 1. Changes in the brain substance.
 2. Changes in the nerve ganglia of the neck.
 3. The results produced by the introduction of brain substance into a small laboratory animal.

PRECAUTIONARY MEASURES.

- (a) In a district where rabies is known to exist one should

distrust a dog when it shows signs of sickness or behaves in an unusual manner.

(b) More especially one should beware of an animal which *appears to have a bone in its throat*.

(c) Remembering that the saliva of a rabid animal contains the virus even before recognisable symptoms present themselves, one should take special care to avoid infection through wounds or abrasions of the hands.

(d) If a person has been bitten by an animal not certain to be rabid, it is advisable, when possible without great risk, not to destroy the animal but to secure it and keep it under close observation, so that within a few days as the symptoms advance a positive diagnosis can be arrived at.

(e) If domestic animals have been bitten by a suspected rabid animal, they should be safely secured and kept under observation.

(f) If an animal has been destroyed and it is desired to ascertain whether it was suffering from rabies, the head and neck should be sent to the Veterinary Laboratory for examination. When possible, the dissection should be entrusted to a Medical man, a Veterinary Surgeon, or officer of the Veterinary Department. Failing this, the operator should wear gloves, and having tied two ligatures round the base of the neck, should remove the head and neck from the body by cutting between the ligatures.

The head and neck should be soaked in a solution of any of the ordinary sheep dips, wrapped in cloths similarly treated, and securely packed in a box or tin, and should be sent by the quickest route to the Veterinary Laboratory, Salisbury.

The reason why it is now recommended that the neck as well as the head shall be sent for examination is that in the rabid animal certain nerve ganglia of the neck are markedly changed and are useful for diagnosis should the brain arrive decomposed or putrid.

(g) When a person has been bitten by a rabid, or suspected rabid animal, he should without delay cauterise the wound and proceed at once for advice to the nearest qualified Medical man or to the Medical Director at Salisbury for Pasteur treatment.

Government regulations relating to rabies will be found at the end of the JOURNAL with the other Government Notices.

Notes on the Management of Dairy Herds.

By R. C. SIMMONS, Chief of the Animals Industries' Branch.

By the term dairy herd, is meant, of course, a herd of cattle which is kept primarily for the production of milk or milk products for sale. The owner's mind, therefore, must constantly be concentrated on three main points, namely:—

- (1) A constant supply—the supply must not fall below a reasonable winter minimum;
- (2) Economy in production;
- (3) Cleanliness.

No dairy can be profitably conducted if any of these three factors are neglected.

Consider first the constant supply. Whether the farmer sells his milk wholesale to the town dairyman, or retails it himself, he must, if he would command an assured custom, be able to fulfil his contracts all the year round. He may be able to supply very much less in winter than in summer, but he must supply a reasonable amount, and whatever he undertakes to supply, winter or summer, he must unfailingly produce. Failure in this direction has been the cause of loss in many dairy ventures, and has been mainly responsible for the hold that imported butter and tinned milk still have on the trade of this country. Before taking up contracts then, the farmer must calculate just how he is going to provide the necessary food for his cows for each month of the year, sow his crops accordingly, or make provision for the purchase of food in the best market.

Regarding economy in production, it would seem unnecessary to caution anyone, and indeed it is so if the farmer always knows when he is producing his milk economically and when not. The old haphazard methods are fortunately dying out, but the adoption of modern methods cannot be

too often or too earnestly recommended. During a recent visit to England and Ireland, the writer had an opportunity of visiting a number of dairy farms. The one outstanding feature of the management of these farms now, as compared to the management of them fifteen years ago, is that almost invariably every cow's milk is weighed (in many cases at each milking, but in most once a week), and the most careful consideration is given to the question whether or not each individual animal is paying for the food and attention bestowed on her. The cow gets nothing on credit, except perhaps her keep for a few weeks before calving, for all else she gets she is expected to pay day by day. If this care has been found necessary in England, how much more necessary must it be here.

Generally speaking, a dairy cow, in order to give the maximum return, must receive some food over and above what she gathers on the veld all the year round. In the best months of the year she may require very little—just enough to amuse her while in the milking shed—and to counteract the effect of very green grass perhaps. In the winter months no cow will continue to milk her best without a considerable amount of artificially prepared food. She may continue in some cases to give a fair bulk of milk far into the winter, but the milk becomes poor, and in the end the cow is greatly reduced to the detriment of her next calf, and ultimate loss in some form or other results. In order to make the cost of production and cash returns bear a proper relation to one another the first consideration is the class of cow. With very few exceptions a native cow will never pay for artificial feeding, and she certainly will not milk for more than a few months in the year, so from the dairyman's point of view she may be discarded. Experience has shown that nothing less than a half-bred cow (that is a cross between a recognised milking breed and a native or Afrikaner) is worth considering.

Having got this class of cow, or something better if circumstances permit, do her as well as can be; she will probably pay for the food and attention. If on examination she does not pay lessen the food given, or change it, until a point is reached at which she pays for her daily ration. If in the end she fails, get rid of her or turn her over to the ordinary beef herd as soon as may be.

Let me emphasize the point that each individual cow should be considered and tested separately, and fed (so far as artificial rations are concerned) with regard to her individual requirements. It is not enough to consider the whole herd and the whole cost of production in bulk.

The third point is cleanliness. How often is this advice given in regard to dairying; how few farmers would admit that cleanliness is not practised in their daily establishments, yet how few of us realise the value of cleanliness and practise it systematically and thoroughly. How often, when we really intend to exercise great care, do we allow the cows to be milked when they are covered in dust, which falls into the milk, or we permit the milk to stand in a bucket uncovered in the neighbourhood of the cowhouse or kraal, exposed to dust, flies and undesirable odours for several minutes before being taken to the separator or dairy, or the milkers fail to wash their hands, or if they wash them for the first cow others are milked after handling dirty reims, etc., without any subsequent washing. We scarcely ever keep a clean apron or smock to wear over our dirty clothes when we are milking and separating. Buckets are washed, it may be, but often stand in the dust all day, and the milk is put straight into them on the top of the dust. One might enumerate dozens of small neglects which daily occur in every dairy, notwithstanding which, the casual observer would remark: "How beautifully clean everything is."

There is in England a business dairy establishment in which all these small points with regard to cleanliness are considered, and, in fact, never lost sight of. The result is that milk from this dairy is sent in bottles by train to London at all seasons, across London in an open van, by train from London to Liverpool, and thence across the Atlantic in cool chambers, for the use of passengers, and over a period of years no complaint has been received from the purchasers, notwithstanding the milk receives no Pasteurisation nor other preservative treatment whatever beyond being cooled to 35° before bottling. When it is added that only the same number of hands are employed in this dairy as in any other dairy of the same size, it must be admitted that there is a great deal more in perfect cleanliness than is usually thought to be the case.

The Rhodesia Land Bank.

By W. OLIVE, Acting Manager, Rhodesia Land Bank.

That the agricultural industry of Rhodesia is in need of financial assistance, apart from that afforded by the ordinary Banking Institutions of the country, has for some time past been realized and it is a matter for congratulation that the want has been filled by the establishment of the Rhodesia Land Bank, an Institution which it is believed will do much to stimulate the agricultural development of Rhodesia and to promote prosperity amongst the farming community, by the supply of money at a low rate of interest to those in need of it who can offer satisfactory security for its repayment.

It is recognised that the ordinary Banks of the country have done good service to the farmers by means of loans and advances against crops, but those Banks are designed primarily to meet the requirements of the merchant and trader which differ greatly from the requirements of those engaged in agricultural pursuits, who have their special needs.

The merchant usually turns over his capital several times in a year and under modern business methods little time is lost between the purchase and the realization of his goods, therefore as money is coming in daily he is able to calculate fairly accurately when his obligations can be met.

The ordinary Bank, being desirous of earning as much profit as possible for its shareholders, therefore confines its operations mainly to the quick-moving business of the merchant so as to earn commission on its capital as many times as possible during the year.

The position of the farmer is different from that of the merchant. The farmer is dependent upon the seasons for his crops and a considerable period must necessarily elapse before he can expect to reap any reward from his investments in livestock or implements on his farm. The difficulty

of telling with any degree of certainty when he will be able to repay borrowed money is a real one with the farmer who therefore requires a long loan which he will not be called upon to repay at an inconvenient time. The short loans usually obtainable from the ordinary Banks do not meet his wants and he is often compelled to borrow money at a very high rate of interest from other sources.

Enough has been said to demonstrate the need for a special type of Bank to meet the wants of the farmer and to provide him with that ready credit which should be as necessary to him as to the merchant and which should be obtainable at a moderate rate of interest.

It will be obvious that a Bank which caters for the farmer's requirements on these lines cannot be expected to make large profits and that it must be conducted with economy, on strict business principles.

The Bank in performing its functions must not be actuated by philanthropic motives and business of a speculative nature must be avoided.

In establishing the Rhodesia Land Bank the immediate object of the Directors is to advance moneys in moderate amounts to small farmers on the security of landed property, other than town property, or on approved security. It is not desired to transact ordinary Banking business or to interfere with the operations of existing Banks or Mortgage Companies, but rather to help the farming community, and especially hard working men of moderate means, to acquire or improve their holdings.

For the information of readers of the AGRICULTURAL JOURNAL a summary is given below of the principal conditions under which advances are made to farmers by the Rhodesia Land Bank on the security of land within Rhodesia.

1. Advances are made on First Mortgage over landed property or on deposit of other approved security.
2. Advances are made for all or any of the following purposes :—

- (a) For the purchase of land or to enable existing liabilities on land to be paid off.

- (b) For the purchase of live stock, plant, and agricultural implements generally.
- (c) For effecting improvements on land, including farm buildings, fencing, irrigation works and afforestation.
3. No advance is made to any one farmer of a greater sum than £2,000.
 4. Interest on advances is charged at the rate of 6 per cent, per annum, payable half-yearly on the 30th June and 31st December of each year at the office of the Bank in Bulawayo.
 5. All advances must be repaid in instalments within a period not exceeding ten years, but may be paid in a shorter period if the borrower so desires.

As advances are made mainly for the purpose of being expended in reproductive works or in the acquisition of live stock, it is considered that the farmer's ability to repay would increase each year. It has, therefore, been arranged that the repayment of loans may be made on the following scale, viz.:

During 1st and 2nd years	...	Nil.
At the end of the 2nd year	...	4 per cent.
" " 3rd "	...	7 "
" " 4th "	...	9 "
" " 5th "	...	11 "
" " 6th "	...	12 "
" " 7th "	...	13 "
" " 8th "	...	14 "
" " 9th "	...	15 "
" " 10th "	...	15 "

100 per cent.

6. The costs and fees of preparing or discharging any mortgage, pledge or other security must be paid by the mortgagor or pledgor to the bank.
7. A fee of £1 is charged by the Bank on each application for a loan.
8. Where it is necessary to inspect a farm in connection with an application for a loan, the actual salary

and travelling expenses of the Bank's Inspector during the time he is so employed must be paid by the applicant. The Bank reserves the right to decide whether or no an inspection is necessary.

9. All applications for loans must be made on the prescribed form, copies of which may be obtained on application to the Manager of the Rhodesia Land Bank, Limited, Bulawayo.
10. Each application for a loan must be accompanied by a remittance of £5 on account of Inspection expenses and to cover the Bank fee. If an inspection is not necessary the sum of £4 will be refunded.
11. No advance will be made upon the security of any unsurveyed land, or of any stands situate within the limits of any municipality or township, but such unsurveyed land or stands may be accepted as collateral security, provided it does not constitute the main part of the security.
12. No advance on the sole security of land will be made for more than 60 per cent. of its agricultural or pastoral value plus 60 per cent. of the value of the permanent improvements thereon as determined in both cases by the Bank, and no advance will be made on the security of land not permanently occupied and beneficially cultivated or worked.
13. Title deeds of property hypothecated to the Bank must be deposited with the Bank, and will be retained as long as the property to which they relate remains hypothecated to the Bank.
14. All Mortgage Bonds must contain the following covenants on the part of the mortgagor in addition to provisions for payment of interest and principal as they fall due and other usual clauses, viz. :—

That the mortgagor will so long as the money remains owing keep in good repair and condition all buildings and other improvements on the land, and the Bank reserves the right to enter upon the land to inspect such buildings and improvements.

That if the mortgagor fails to keep the buildings and improvements in good repair and condition, the Bank may, at the cost of the mortgagor, undertake such work.

That all moneys expended by the Bank in keeping in repair buildings or improvements as aforesaid, or in the insurance of the same, shall be recoverable by the Bank on demand. Insurance shall be effected as may be prescribed by regulations or instructions of the Bank, and every policy of insurance so effected shall be ceded to the Bank as collateral security.

That if the mortgagor makes default in the full and punctual payment of any instalment of interest or principal, or if, and whenever the mortgagor makes default in the other conditions of the Bond the Bank shall have power to enforce payment of all sums owing, on thirty days previous notice in writing to the mortgagor.

That if the mortgagor is in default or commits any breach of the Bond the Bank shall have the right to call up and compel payment of all principal, interest and other owing under the security.

That the mortgagor will at all times cultivate and manage the lands hypothecated in a skilful and proper manner. Failure in this respect shall entail the immediate recovery of the advance should the Bank so desire.

The foregoing notes embody all the main conditions under which the operations of the Land Bank will be conducted, but the Directors will no doubt supplement or amend these conditions from time to time as experience shows such a course to be desirable in the interests of the Farming community as well as that of the Bank.

The time does not appear to be yet ripe for the introduction in Rhodesia of a system of personal credit, or of co-operative banking on the lines of the credit societies which have achieved so much success in Europe, but there may be other ways in which the Rhodesia Land Bank may associate itself with the farming community, in addition to rendering financial assistance, and the management would be pleased to consider any suggestions which may be offered on the subject.

Mendelism.

*A paper read before the Hartley Farmers' Association by
J. C. Stewart, compiled from "Mendelism," R. C. Punnett.*

The subject of this paper has to do with the principles of heredity discovered by Mendel about 50 years ago.

Mendel was born in 1822. He was a priest and afterwards became Abbot of Brün, in Austria. He made many experiments with plants and wrote some papers to the Natural History Society of Brün. His work on hybridisation of plants remained practically unknown for 35 years, and his best known experiments were with the common eating pea (*pisum sativum*).

It was a plant that lent itself very well to his experiments, as the separate flowers are self-fertilizing, and there are numerous varieties exhibiting characters to which they breed true. In some varieties the seed is yellow, in others it is green. In some varieties the seed is round and smooth, in others wrinkled. Some peas have purple, others white flowers. Some peas grow to a height of 6 feet, and others are dwarfs which do not exceed 1½ or 2 feet.

Mendel selected a certain number of such differentiating characters, and investigated their inheritance *separately for each character*. Thus in one series of experiments he concentrated his attention on the heights of the plants. Crosses were made between tall and dwarf varieties, which previous experience had shown to come true to type with regard to these characters. It mattered not which was the pollen producing and which the seed-bearing plant. In every case the result was the same—tall plants resulted from the cross. For this reason Mendel applied the terms *dominant* and *recessive* to the tall and dwarf habits respectively. The

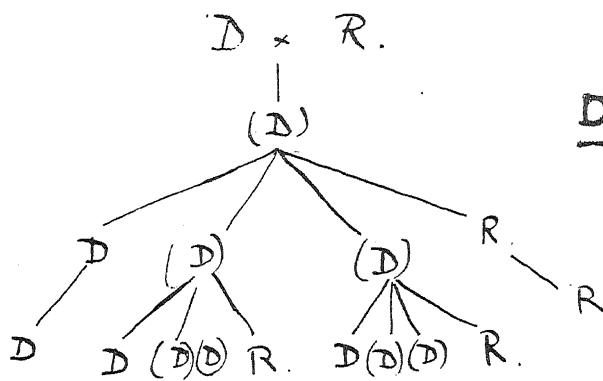


Diagram A

D = Dominant

R = Recessive -

in brackets signifies impure

next step was to collect the seeds thus formed and to sow them the following year. When this was done, it was found that both tall and dwarf plants appeared. Each individual was either tall or dwarf, no intermediate appeared, and the tall plants were three times as numerous as the dwarfs. In other words, the dominant and recessive characters occur in the second generation of hybrids in the proportion of three to one. In the following year the seeds of this the second generation were sown as before.

From the seeds of the dwarf came only dwarfs i.e., the recessive character bred true. The tall plants, however, were not all the same nature, some of them produced seed which gave rise to tall plants only—others again formed seed from which sprang both tall and dwarfs in the proportion of 3 to 1. The tall plants of the second generation were of two kinds, i.e., those which carried only the tall character and those which carried both the tall and dwarf characters. The former we may call *pure* and the latter impure dominants. Mendel found these ratios from a large number of plants between one and two thousand.

I wish to refer now to diagram A.

By breeding subsequent generations Mendel showed that the pure dominants and recessives always bred true. The impure dominants always gave dominants and recessives in the constant proportion of 3 : 1; that is, 1 pure dominant—2 impure dominants and 1 recessive. We have considered the case of one pair of characters only, but Mendel showed that the rule holds good for all the various pairs of differentiating characters studied by him.

Whenever there occurs a pair of differential characters, of which one is dominant to the other, three possibilities exist: there are recessives which always breed true to the recessive character; there are dominants which always breed true to the dominant character and are therefore pure; thirdly, there are dominants which may be called impure, and which, on self-fertilization (or in-breeding where the sexes are separate), give both dominant and recessive forms in the fixed proportion of 3 dominants to 1 recessive.

Mendel himself verified this principle of dominance for several characters of the pea, finding round seeds dominant over wrinkled, coloured seed coats over white seed coats, yellow seed colour over green, etc.

Within the last few years the validity of the principle has been extended to numerous differentiating characters, in animals as well as plants. To mention but a few cases:—the coloured coat of mice and rabbits is dominant over the white or “albino” coat; the long angora fur found in some rabbits is recessive to the normal, short fur; the rose-comb which occurs in certain breeds of poultry, such as Hamburgs or Wyandottes, behaves as a simple dominant towards the high serrated “single” comb characteristic of Leghorns, Andalusians and others.

Owing to the numbers in which they can be produced, and the ease with which they can be controlled, plants lend themselves more readily than animals to investigations of this nature.

In wheat and barley the beardless have been shown to be dominant over the bearded forms.

It has also been shown that the earlier ripening habit of Polish wheat is recessive to the later ripening habit of Rivett wheat.

A still more interesting case occurs in the same species of plant. Certain forms of wheat are highly susceptible to the attacks of a fungus which causes “rust,” whilst others are immune. It has recently been shewn that immunity in this instance behaves as a recessive to the non-immune condition. When an immune and a non-immune strain are crossed together, the resulting hybrids are all susceptible to “rust.” On self-fertilization, such hybrids produce seed from which appear dominant rusty and recessive immune plants in the expected ratio, 3 : 1. From this simple experiment the phrase “resistance to disease” has acquired a more precise significance, and the wide field of research opened up in this connection promises results of the greatest practical importance.

The Practical Application of Mendelism.

By J. A. T. WALTERS, B.A., Assistant Agriculturist.

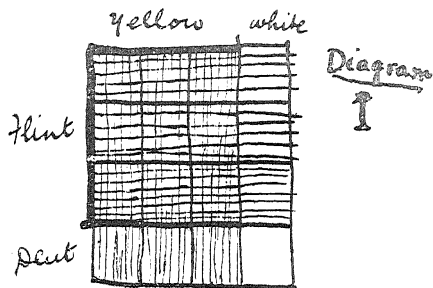
Any one can convince himself of the truth of the foregoing statements by a series of simple experiments either with plants or with animals; and now-a-days the greatest use is being made of the knowledge of the laws which govern the inheritance of characters, to produce new and more useful breeds of flowers, animals and crops. It is found almost without exception that every character belonging to a plant or animal acts as a dominant or recessive, and behaves in the way described above. The seeming exceptions are mainly confined to colours; but there is very little doubt that even those colours which do not seem to behave in accordance with Mendel's laws will be found to do so when the conditions regulating colour are better understood. One thing must, however, be clearly borne in mind: that the plant or animal to be experimented with must be true to type for the character under consideration. For example, in the farmyard will frequently be found cockerels of a speckled bluish-black and white colour sometimes called "cuckoo" fowls. This colour in poultry is dominant to almost any other colour. So that if one of these is used exclusively for breeding, all the resulting chickens in the first generation will be "cuckoo" coloured. Now the Plymouth Rock breed is true to type for this colour character, and if a cockerel of this variety is used for this purpose the progeny will be uniformly of the same colour as the male parent. But if any occasional cockerel which happens to have these markings is used the progeny will not be uniformly marked in this way, because this bird is not true to type with regard to this particular colour. Or again if in the same plot of wheat two plants are found, one tall and one short, and if these are crossed there is no likelihood of the progeny behaving according to the above laws. For the dwarf plant is probably only accidentally a dwarf and is therefore not true to type for this character. When this point is clearly understood no disappointment is likely to ensue.

Now the problem for the farmer may briefly be stated to be "the combination of desirable characters in a single individual." And for the breeder every plant or animal is an aggregation of characters which are to be combined in the way he chooses, and when he remembers the mathematical exactitude with which these characters obey certain laws he knows with certainty that ultimately that there is no combination of characters which he cannot accomplish in a single individual.

It is stated above that every plant is an aggregate of characters. Take the maize plant to illustrate what is meant. It has a tall or dwarf character, yellow or white grains, early or late maturing habits, a strong or weak stem, a high or low placed cob, a dent or a flint grain, a high or low sugar-content, a tillering habit or not, drought resisting, moisture loving, etc. The combination of characters desired can only be obtained from many different plants, and sometimes the character required can be obtained without crossing by simple selection in the field. For instance it may be desired to produce a mealie combining the following characters:—

- 1.—Suitability to Rhodesian Climate.
- 2.—Slow maturing habit.
- 3.—Heavy yield.
- 4.—White grain.
- 5.—Dent type.
- 6.—Deep grain.
- 7.—Tall plant.

Having set himself the task of producing such a mealie the breeder will proceed as follows:—He will first find out by trying many varieties which is likely to grow best in the Rhodesian climate, and we will imagine that the variety selected was Yellow Congo, a tall growing, late maturing, yellow flint variety. It will be observed that this variety at once combines numbers 1, 2 and 7 of the desiderata given above. It is now necessary to improve the yield (No. 3); to convert the yellow flint grain into white dent (Nos. 4 and 5); and to improve the depth of grain (No. 6). Numbers 3 and 6 can be done, and are most frequently done, by selection of good seed and by selection of deep grain on the cob, and we



Pure dominant $y y$

Pure recessive $w w$

Impure dominant



Pure dominant $y y$

Impure dominant $y w$

(crossed with white)

Giving

yw yw yw ww yw ww

Diagram 2

will therefore not consider them in this article. Numbers 4 and 5 can be produced only by crossing—no amount of selection will produce a white grain out of yellow flint. And for the purposes of crossing, a plant will be selected resembling the other as much as possible except of course in those characters which it is desired to impart to the original plant. Such a mealie would be found in Hickory King, which is also a tall late-maturing variety, but with white dent grains. If the pollen from either of these is applied to the silks of the other, and all other pollen is carefully excluded, the resulting seed will show the effect of crossing and will, in both cases be a yellow flint. If now these seed are grown again next season and all foreign pollen excluded, the resulting seed will no longer be a yellow flint but will consist of the following types in the following proportions :

Yellow flints, $9/16$ of the whole.

Yellow dents, $3/16$ of the whole.

White flints, $3/16$ of the whole.

White dents, $1/16$ of the whole.

Whiteness and dentness are both recessive characters, and as Mr. Stewart has pointed out, recessive characters always breed true to type. If therefore the white dent seeds are sown by themselves, and all foreign pollen is excluded as before, they will breed permanently true to a white dent type which will then be established.

The simple diagram marked I. will show how the above proportions are obtained when two characters are combined. In the second generation the dominants are three times as numerous as the recessives. The top horizontal line indicates this for colour and the vertical line for shape of grain.

Our maize now has a white dent grain. But here a word of warning must be given. It is possible that in obtaining these characters by a cross we may have also introduced characters that we did not require. Thus we might have introduced the Hickory King's inability to stand drought. For when two plants are crossed *all* the characters in which they differ act as simple dominants and recessives. The breeder, however, can do a great deal by selection, once he has obtained the character which he was working for.

I have indicated above how recessive characters are fixed. The fixing of dominant characters is a much more difficult matter. It really means nothing more or less than picking

out the pure dominants from among all the dominants of the second generation. Now we know that one third of these dominants are pure, although they do not differ outwardly in any way. In the case of the maize just referred to, when yellow was crossed with white, we got in the second generation three parts yellow seed and one part white seed. We also know that one third of the yellow seed is pure for yellowness. So that, as far as colour is concerned, the second generation seed may be classified as follows:—

$\frac{1}{4}$ pure dominants (yellow)	} Indistinguishable from each other.
$\frac{1}{2}$ impure dominants (yellow)	
$\frac{1}{4}$ pure recessives (white)	

Now if all the dominant yellows (pure and impure) are again crossed with the recessive whites, the *pure* dominants will yield *nothing but yellow*, but the impure dominants will yield *both whites and yellows* in equal numbers. This arises from the fact that an impure dominant yellow is really made up of both yellow and white equally, but the yellow is the only colour that shows. The diagram marked II. will show how the result is obtained.

Half the impure dominants will be seen to give pure white seed; the pure dominants will all give yellow seeds. In maize breeding the practice is to self-pollinate the cobs in the first generation, and use but little of the seed of each resulting cob for the purpose of crossing with the pure recessive. For example, a number of cobs are self-pollinated. A few of the grains of each cob are sown in rows separately and crossed with pollen from a pure white variety. The remainder of the seed on each cob is saved. Of the rows thus crossed with white, some will contain nothing but yellow grains. We are then certain that the original cobs, from which these seeds were obtained, are pure dominants. The seed which was saved from these parent cobs are thus proved to be pure dominant yellows. The remainder of the rows will contain both white and yellow grains in equal number. The parent cobs belonging to these rows are impure dominants, and may be discarded for further breeding.

It will thus be seen that fixing a dominant is a more complex affair than fixing a recessive. But the result is none the less certain if care is exercised throughout.

It is rare that more than two characters are combined at one time. When a cross is made involving two pairs of characters, the seeds in the second generation will consist of one-sixteenth pure for any combination of the two characters,

Tobacco Culture.

CIGAR LEAF EXPERIMENTS.

The Department of Agriculture has obtained a few varieties of cigar seed for free distribution to farmers who have likely soil and who wish to give this type of leaf a trial. The varieties are Summatra, Cuban Seed Leaf and Zimmer Spanish, and application for the seed should be made to the Tobacco Expert, Department of Agriculture, Salisbury.

To be suitable for cigar leaf the soil should be a rich sandy loam, and the area situated at a low altitude with a warm and humid atmosphere. There are two types of cigar leaf, the wrapper and the filler, which as far as can be gathered require distinct soils. Experience alone can teach us which type our conditions are best suited for, but if it is found we can grow a good grade leaf of either a ready market and good prices are assured. The Summatra is the highest grade wrapper in the world and is grown on a lighter soil than the fillers, which of course do not command the price of the former. The wrapper must have style and be elastic, thin in texture, finely grained, light and uniform in colour, while the stem and veins must be small and of the same colour as the leaf. The leaf should be as free from flavour as possible as it is the portion which comes in contact with the mouth.

The seed bed should be set out in the same way as with Virginia tobacco, but in planting out the plants should be placed about a foot to fourteen inches apart only, for if cigar tobacco is given too much room the leaves will become too large and coarse for the purpose required. The rows should be about three feet apart and the plants should be fertilised in about the same proportion as Virginia leaf. With Summatra no topping should be done until the field is well in bloom, when the plants should be topped very

high in order to produce a leaf of fine texture. The Cuban tobacco is a smaller plant and the leaves require to be topped lower. Suckering should be performed frequently during the course of the season.

Most types of cigar leaf are cured on the stalk, but with Summatra the plant ripens unevenly and it is therefore necessary to harvest it by the single leaf method, as a slight difference in the ripeness of the leaf intended for wrappers makes a large difference in the value. Cigar leaf is air-cured, and the tobacco after harvesting should be strung on sticks in the usual way and hung in a covered shed to dry as is done with Virginia.

As the supplies are limited it is requested that only farmers situated where the climate and soil conditions are promising and who intend giving the seed a *bona fide* trial will apply. The Tobacco Expert will be pleased to hear from time to time how the crop is faring and to tender any advice he can give on the subject.

Tobacco Culture.

GENERAL REMARKS.

By J. W. LEWIS.

The best land for growing fine yellow tobacco is a loose sandy soil. In choosing land for tobacco always select land free from excessive moisture, and which is not likely to become wet and spongy.

Tobacco requires the most thorough preparation of the soil and the very best cultivation is absolutely necessary to ensure success. If the land be new, break up the ground early. Turn the green grass under as deep as possible, and pulverize the soil before planting by continuous disc harrowing. Ridging is to be recommended in some cases—if not in all—it saves time in planting, makes cultivation easier and keeps the plant from washing out or getting

covered with earth. If the ridges are high the harrow or roller should be run over the field.

When planting time arrives draw the marker across the rows from one side of the field to the other—this will mark the places where the plants have to be set.

Cultivation is a matter of great importance and must be especially attended to. The first cultivation should be done with small tooth hoes which must be run close to the tobacco, and this can be followed by a few boys with weeding hoes with which to break any crust that may have gathered around the plants. Each succeeding cultivation may be done with broad hoes and further away from the plant. Keep the soil loose and light, for the looser the soil the more chance the plant has to make a quick growth and develop a thin leaf.

Seed beds must be situate close to a good supply of water and, if possible, on rich black soil of a sandy nature. The sides should be bricked up 5" or 6" and the bed covered with a light muslin. An extra covering of grass will be beneficial until the plants are up—this keeps the beds shaded and moist, thus hastening germination. One tablespoonful of seed is sufficient to sow 75 to 100 square yards. The seed beds must be kept well watered and not allowed to get dry or crusted.

Harvesting may commence as soon as the bottom leaves shew signs of ripening. Care must be taken in reaping. The most intelligent boys should be selected for this work, and they should be cautioned to examine each leaf before pulling it from the stalk.

It is impossible to cure green and ripe tobacco in the same barn and turn out good tobacco. Conditions vary so much that there is no general rule in regards to curing, which can be applied in every case. Care should be taken to reap only ripe tobacco of as near the same quality as possible, and the leaf must be handled very carefully. Fires should be started the same day as the tobacco is reaped. The yellowing stage may vary from 85 to 110 degrees according to the condition of the tobacco. Thin ripe tobacco can be yellowed at a much higher heat than heavy or green tobacco, and 85 to 90 degrees is generally a safe temperature to start with, increasing the heat as the condition of the tobacco demands.

Feeding and Care of Imported Bulls.

By R. C. SIMMONS, Animals Industries Branch.

Comparatively few farmers in Rhodesia have been accustomed for any length of time to handle pure bred stock reared under conditions such as obtain on the best stock farms in Great Britain. A few notes and suggestions, therefore, as to the treatment of pure bred bulls, especially those imported from overseas, may be acceptable and instructive. The importation of a bull, even with the assistance of the Government, is, to most farmers, a considerable undertaking financially and otherwise, and unless the bull ultimately proves successful it is doubtful if the venture is very profitable.

In order that the greatest profit and benefit may be derived from a bull, it is necessary that he should be kept as nearly as possible in the very best of health and in good condition.

The reason bulls are imported is to give greater size, earlier maturity, better milking, or better beef qualities to local cattle, and the fact that they are capable of imparting these qualities argues a much softer life for many generations than that to which local cattle are accustomed. Again, the change from a moist, cool, insular climate, and often rich pasture, to our high inland conditions and totally different veld, to say nothing of the ordeal of inoculation on arrival, all entails an enormous strain on the animal's constitution, and he cannot be expected to acclimatise without considerable care and attention on the part of his owner.

As one travels round the country it is noticeable that owners of bulls, whilst often exercising care and thought, have a tendency to err in two directions: either they expect the bull to graze and live practically the life of a native beast straight away, or they over feed and under exercise him, forgetting that healthful condition and not merely fat is what should be aimed at. The first error, that of too harsh treatment, appears to arise either from an inadequate appreciation of the value of a good bull, and an unwillingness to spend a few extra pounds on him, or from the idea that if

the bull is housed and fed to any extent his progeny will show delicacy and want of constitution. The second error, that of too much pampering, arises of course, merely from too great anxiety to do the bull well. Now although exceptionally a few individual animals have in the past apparently acclimatised and accustomed themselves to local conditions quickly and with little extra attention, yet, for all practical purposes, one may take it for granted that an imported bull cannot run on the veld for the first year or so and retain his full condition and vigour without special attention. It is true that many imported bulls run all day and are fed a little at night and in the morning, and appear well and one may perhaps say healthy, but with scarcely any exception their appearance shows that bulls so treated are not equal in size or general condition to what they would have been with more careful attention.

Calves which are the progeny of a bull in an indifferent state of health will not be so strong or so hardy, or so able to withstand local conditions, as calves which are the progeny of a bull in full health. Feeding and housing the bull does not cause softness in the progeny but has exactly the opposite effect.

In order to keep the bull in the requisite condition a modified form of the home methods of housing and feeding must be adopted, and the following rules may be taken as a guide:—

1.—Wherever possible, make a small camp of say 20 or 30 acres in extent, having in it a shed, built on the lean-to principle large enough to house 3 or 4 cows and the bull. The size of shed that will be found useful is approximately 20' by 14', 10' high at the back, the ends and half the front closed, and a manger running along the whole length of the back. It may be built of burnt or raw brick or wattle and daub, with an iron, or preferably a thatched roof.

2.—The bull should live entirely in the camp, especially during the winter months. Two or three of the older, dry and in-calf cows may be left with him for company as otherwise he will not rest contented in the camp.

3.—The bull should have constant access to clean water, and should be fed in the shed. He should be groomed daily, and kept free from ticks by spraying twice a week or so, or by dipping, except perhaps in very cold weather.

4.—Cows requiring the service of the bull should be turned into the paddock with him and should be removed as soon as it is seen that they have been properly served. They may perhaps be left in all night. They should not be with the bull during the heat of the day. It is most undesirable to let the bull run with the herd and have to fight his way with other bulls. He is quite unfitted for this sort of a thing, and to ask him to do it is merely using up his energies to no good purpose.

5.—The farmer who is contemplating the purchase of a bull should begin to prepare for his reception well beforehand and should take steps to be provided with some of the following foodstuffs:—

Roughage—Ensilage, Velvet Bean Hay, Manna Hay, Teff Grass Hay, Mealie Storrs or Veld Hay.

Cereals—Oat Forage, Mealie Meal, Bean Meal.

Green Forage—Lucerne, Paspalum, Green Barley or other green crops.

Roots—Half Sugar Mangel, Mangels, Cabbage, Turnips, Carrots or Pumpkins.

Oily Foods—Linseed or Sunflower Seed.

I have enumerated the various kinds of each class of food more or less in order of merit. If these foods are required for the bull only a very small acreage will suffice, and most of them may easily be provided if a small area of irrigable land is available.

6.—The following daily rations should be suitable for a beast weighing about 1,000 pounds live weight, but is given rather as an example than as a definite prescription, it being always necessary to use considerable judgment in the feeding of every individual animal. The amount can be varied according as the animal is larger or smaller:—

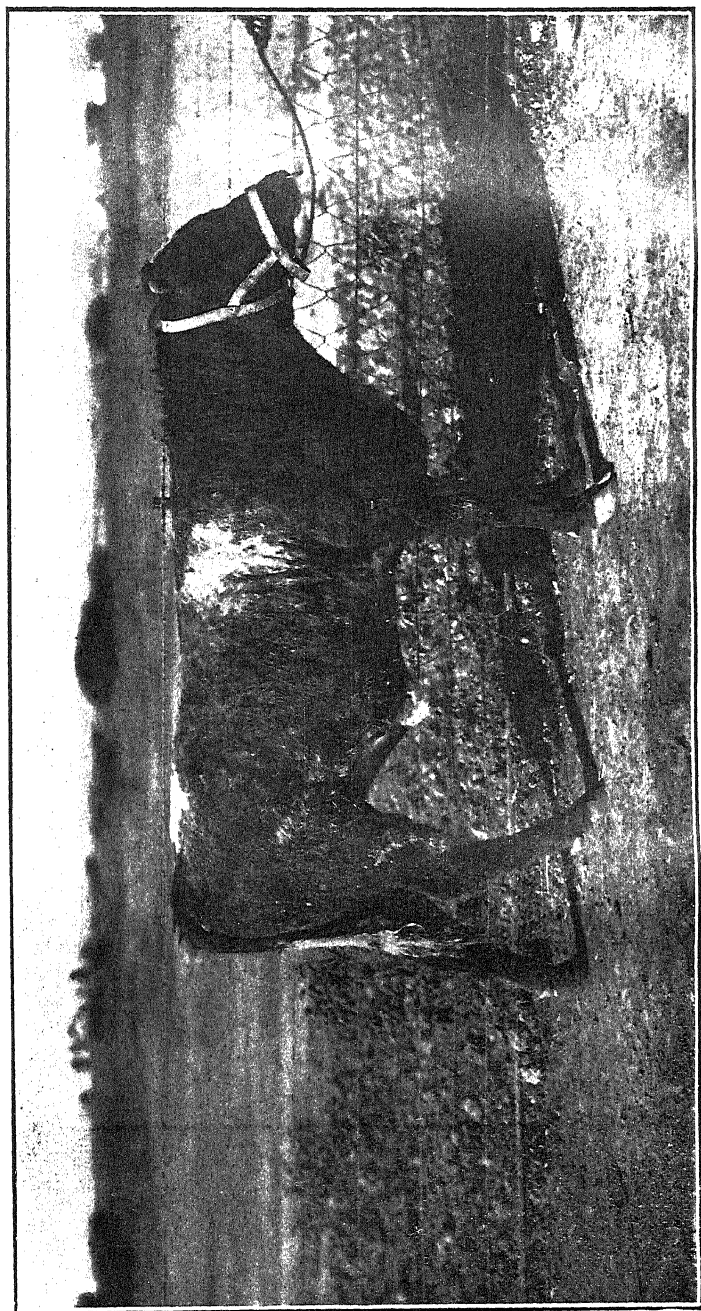
Mealie Meal, 3 lbs.

Or Mealie Meal ground on cob, 4 lbs.

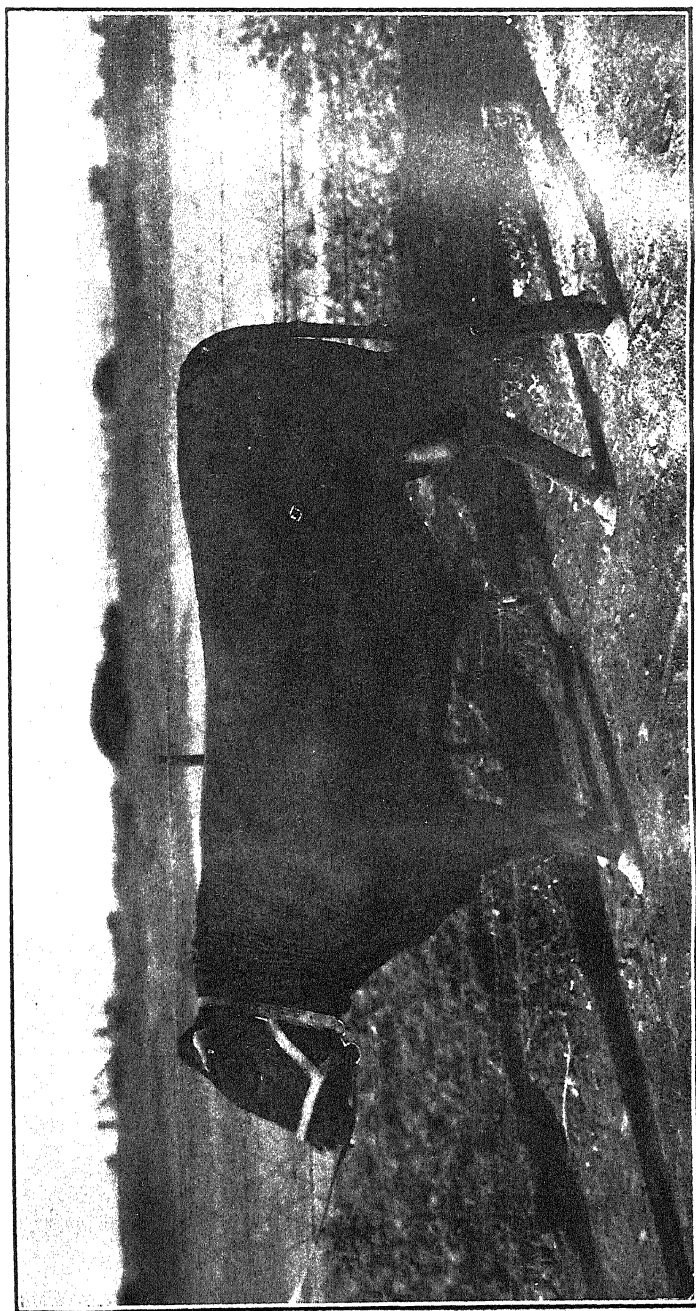
Linseed Meal or Sunflower Seed Meal, 1 lb.

Roots or Green Forage, 25 lbs. to 45 lbs. per day.

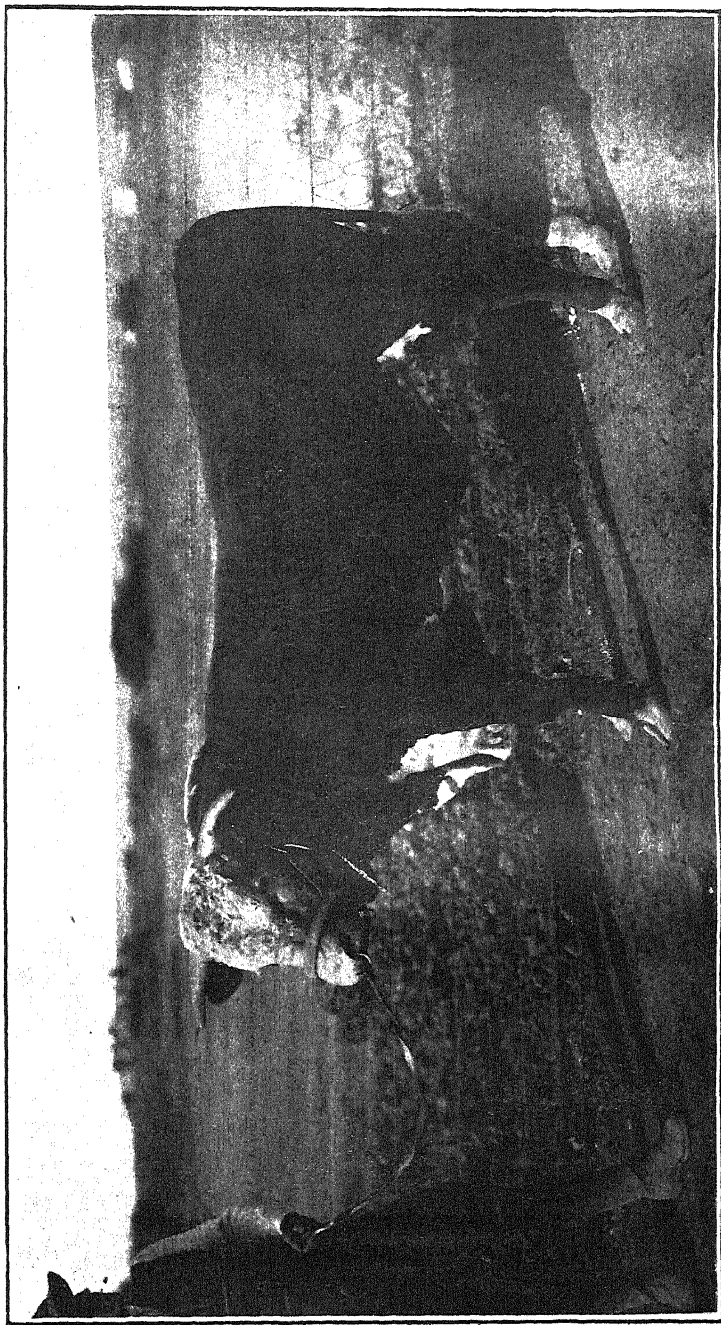
Roughage: all that the animal will eat, but should be made up of about 5 lbs. better forage and the balance stover or veld grass.



Shorthorn Bull, "Leighton Artist," calved April 20th, 1911. Bred by Mr. J. Murray Naylor, Leighton Park Farm, Welshpool, and imported by Mr. H. Williams, Macheke.



Devon Bull, "Chorister," calved 11th May, 1911. Bred by Mr. C. L. Hancock, Taunton, Somerset,
and imported by Mr. H. Williams, Macheke.



Hereford Bull "Scribe," born February 8th, 1911. Bred by Mr. J. R. Hill, Orleton Manor, Hereford.
Imported by Mr. H. Williams, and purchased by Mr. A. W. Partridge, Salisbury.

Linseed or sunflower seed may be easily ground in an ordinary mealie mill if about one third mealies are added.

7.—In feeding such a ration, as is above indicated, the following considerations must be taken into account.

- (a) Mealie Meal, Bran Meal, Linseed and Sunflower Seed are concentrated foods. The Mealie and Bran Meal, especially the former, are heating. Linseed and Sunflower Seed are relaxing in their action.
- (b) If a full ration of roots or green forage is available the Linseed ration may perhaps be reduced, particularly if the animal should show signs of scouring. On the other hand, if little succulent food is obtainable and chiefly Veld hay and the like is used as roughage the Linseed Meal may be increased.
- (c) If Linseed Meal is not available, 2lbs. of Bean Meal may be added to the ration, and every effort made to provide a fair amount of green food.
- (d) In any case the concentrated foods should be given sparingly at first, until the animal has become used to them. An excess of Mealie Meal is likely to cause digestive trouble. Any change or increase in the rations should be made gradually, and with some animals coaxing by means of feeding little bits at a time may be necessary, in order to get them on to their feed.
- (e) In summer when the grain is plentiful and the weather warm, all rations may gradually be reduced, especially Mealies, Linseed Meal and roots, care being taken that the animal does not fall off in condition.

8.—The day's feed should be given somewhat as follows:—

Morning—Half the concentrated foods, and a little later one third of the root and green forage ration, or, a mixture of all this together with a little chopped hay may be given if by trial it is found that the animal eats it best this way.

Midday—One third root ration and hay.

Evening—Same as morning.

A salt-lick in a small box or in the manger is usually a good thing.

Roughage should be available pretty well all day in the manger or rack.

If practicable, the bull should be seen the last thing at night, and the supply of roughage replenished.

9.—The shed should be cleaned out at least once a day, merely removing the soiled straw and replacing with a little clean.

10.—Animals will sometimes be found to eat their food more readily if the ration of concentrated foods and roots, green stuff and chopped hay, be mixed up together the day before, and allowed to stand for 24 hours before feeding.

The best method of doing this is to use a clean board, brick or cement floor, or may be a sheet of iron or a bucksail. Put down first a layer of chaffed hay, then sprinkle on a little of the meal, etc., and perhaps a little salt; then a portion of the roots. Repeat the process until the quantity required for the day's ration is complete. Shovel the whole up together until well mixed, and leave in a heap with a few old sacks over it. The result is a slight fermentation which softens the hay, and the meal adheres to the hay and roots, making it more palatable to the beast than it is in a dry powdery form. Cleanliness should be observed in mixing foods. The ration given should never exceed what the bull will eat at one time. Stale food should not lie in the troughs and manger.

11.—Always treat the animal firmly and kindly. Never play with him or pet him or allow others to do so, as the play is very apt to develop into vice. Most English bulls have rings in their noses, and should the animal by chance show signs of vice, always have him led when necessary with a bull stick. This is only a precaution, and it will probably not be necessary in most cases.

12.—The foregoing suggestions may be modified or departed from if it found that the bull is in full health without them, but I would caution all owners not to mistake full health for full vigour. On the other hand, if for some reason a difficulty is found in getting the bull into condition by these ordinary means, gruel made of mealie meal and linseed, with milk and eggs if possible, will sometimes pull an animal round. This sounds expensive in Rhodesia, but it may mean saving the bull and pulling him through a bad time, which is worth a good deal of trouble and money,

The Manuring of Maize on the Government Experiment Farm, Gwebi, 1912.

By G. N. BLACKSHAW, B.Sc., F.C.S., Government Agricultural
Chemist.

Before proceeding to deal with the results of an experiment on the manuring of maize which has been conducted during the past season on red land at the Experiment Farm, Gwebi, it may be well to briefly discuss the general principles of fertilisation so that those who have not studied any of the numerous publications thereon may clearly understand what is to follow.

During growth, a plant takes up a large number of substances from the soil, the majority of which are fortunately present in almost inexhaustible quantities, quantities so large that the continuous growth of plants without the application of manure would probably not reduce them to a point affecting the productive power of the soil. There are, however, three substances in which a soil is liable to become deficient, these are nitrogen, phosphoric oxide and potash. A fourth may be added, viz., lime, but this substance is generally present in quantity sufficient to meet the food requirements of plants. The beneficial effect of a lime dressing is for the most part indirect in that it improves the physical condition of some soils, and attacks food elements existing in the land in highly insoluble forms, rendering them available to the plant.

The main object of using fertilisers is then to supply one, two or more of the substances mentioned above, and if the soil is only deficient, say, in one of these ingredients, it would,

of course, be waste of money to supply a manure containing them all.

In the trial conducted on maize lands at the Government farm during the past season, the fertilisers used were as follows:—

Supplying Nitrogen—*Nitrate of Soda*, containing 15% nitrogen. Price at Salisbury, £17 10s. per ton (2,000 lbs.).

Supplying Phosphoric Oxide — *Double Superphosphate*, containing 42% phosphoric oxide soluble in water. Price at Satisbury, £16 per ton.

Supplying Potash—*Sulphate of Potash*, containing 50% potash. Price at Salisbury, £19 per ton.

Bats' Guano, containing the following amounts of fertilising ingredients, was also given a trial:—

Nitrogen ...	...	...	5.28 per cent.
Total Phosphoric Oxide	...	4.23	„
Potash ...	...	0.92	„

Bat's Guano occurs in small quantities in caves in various parts of the country. That used in this experiment was obtained from Mr. Gordon's farm Nyaroro, Lomagundi district. The amount present in the cave on this farm is estimated to be at least 100 tons.

The object of the experiment was to determine the effect of these fertilisers upon the yield of maize, and to ascertain the relationship between the cost of the fertiliser dressings and the value of the increased return resulting from their use.

The total rainfall at the Government Farm for the season, October 1911 to June 1912, was $28\frac{1}{3}$ inches, the fall each month during this period being:—

1911		1912	
October ...	0.00	January ...	13.00
November	0.25	February	8.00
December	4.25	March	1.25
		April	1.50
		May	0.00
		June	0.08

The red loam selected for this experiment had already been cropped with maize for two years, but had not previously received any manurial treatment. The mechanical composition of the surface soil (first nine inches) under trial was as follows:—

Coarse Gravel	...	...	over 3 m.m.	0'1
Fine Gravel ...	...	...	1—3 m.m.	2'7
Coarse Sand	...	...	'2—1 m.m.	11'3
Fine Sand ...	...	...	'04—'2 m.m.	15'6
Silt ...	...	...	'01—'04 m.m.	20'2
Fine Silt & Clay (by difference)	under	'01 m.m.		38'4
Loss or Ignition (water and organic matter)				11'7
Calcium Carbonate	...	...	...	trace.
				<hr/>
				100'0
				<hr/>

In the preparation of the land, the ground was ploughed to a depth of seven inches, run over twice with a clod crusher, and twice disc harrowed. The size of each plot was one acre, and each manurial treatment was conducted in duplicate. Selected seed, of the Salisbury White variety, was planted on January 6th and the manure applied broadcast to each plot a fortnight later. During the growing season the land received two cultivations, one being given immediately after the application of the fertilisers. The lateness of planting, which was due to scarcity of labour, should be carefully noted. The shelling was done during the third week in July.

PLAN OF THE EXPERIMENT.

The details of the manurial dressing applied to each plot and the yield of grain obtained are given in Table I.

The questions put to Nature were the following:—

1. What is the effect of supplying superphosphate alone?
Answered in Table I, No. 2.
2. What effect has the application of a complete dressing?
Answered in Table I, No. 6.
3. What is the result when one ingredient is withheld?
Answered in Table I, Nos. 3, 4 and 5.
4. What is the effect of an application of Bats' Guano?
Answered in Table I, No. 7.

TABLE I.

Effect of Fertilisers upon the yield of maize, per acre, on red land at the Experiment Farm, Gwebi, 1912.

	Manurial Dressing, per Acre.	Yield of grain per acre (av'r'g of 2 plots) Pounds	Inc'se due to Manu-ring. Pounds	Value of Increase at 8/- per bag (200lb) on farm	Cost of Manu-rial dress-ing	Profit or Loss per acre
1	No manure ...	1248*	—	—	—	—
2	75 lbs. double superphosphate	1612	364	14/6	13/1	p. 1/5
3	{ 75 lbs. nitrate of soda	1634	386	15/5	25/-	1. 9/7
	{ 75 lbs. dbl. superphosphate					
4	{ 75 lbs. nitrate of soda	1642	394	15/8	20/8	1. 5/-
	{ 40 lbs. sulphate of potash					
5	{ 75 lbs. dbl. superphosphate	2220	972	38/10	19/6	p. 19/4
	{ 40 lbs. sulphate of potash					
6	{ 75 lbs. nitrate of soda	2396	1148	45/11	32/6	p. 13/5
	{ 75 lbs. dbl. superphosphate					
7	200 lbs. Bats' guano ...	1712	464	18/6	?	—

*1,248 lbs. was the average yield per acre of 3 plots on the experimental area, all unmanured.

On the plots, the proportion of cobs 6 inches and over in length to cobs under 6 inches is given in the following table:

TABLE II.

Plots	Cobs 6 inches and over in length %	Cobs under 6 inches in length %
1. No manure ...	30	70
2. Superphosphate alone ...	38	62
3. Nitrate of soda and superphosphate ...	40	60
4. Nitrate of soda and sulphate of potash ...	47	53
5. Superphosphate and sulphate of potash ...	52	48
6. Nitrate of soda, superphosphate and sulphate of potash ...	56	44
7. Bats' Guano ...	49	51

As already stated, the plots were all conducted in duplicate, and in the case of the three dressings which gave the best returns, viz., Nos. 5, 6 and 7, the yields on the duplicate plots were in close agreement.

Yield on duplicate plots—manurial dressings Nos. 5, 6 and 7
(For particulars of dressings see Table I).

No. 5	{ 2162 lbs. 2278 lbs.	No. 6	{ 2368 2424	No. 7	{ 1784 1640
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On reference to the above Tables it will be noted:—

(1) That the application of 75 lbs. of superphosphate alone caused an increase in the yield of 364 lbs., but that the value of this increase, reckoning the value of maize in a normal year to be 8/- per bag on the farm, only slightly exceeded the cost of the manurial dressing.

(2) That nitrate of soda applied along with superphosphate effected little or no increase above that obtained by the use of superphosphate alone, and that the value of the increased return over the land receiving no manure was less than the cost of the manurial dressing.

(3) That the value of the increased return obtained by applying nitrate of soda and sulphate of potash together was not sufficient to meet the cost of the dressing.

(4) That double superphosphates and sulphate of potash applied at the rate of 75 lbs. to 40 lbs. respectively caused an increase of 972 lbs., and that the return for the outlay in manure gave a nett profit of 19s. 4d. per acre.

(5) That the "complete dressing" (nitrate of soda, double superphosphate and sulphate of potash), gave the highest yield of grain per acre (almost double that on the unmanured land), but that the value of the increase over that obtained with the "superphosphate and sulphate of potash" dressing was not sufficient to meet the additional cost of the 75 lbs. of nitrate of soda, and that in consequence the nett profit per acre was reduced to 13s. 5d.

(6) That Bats' guano applied at the rate of 200 lbs. per acre increased the yield by a little over two bags. Sometime ago I valued this material, compared with the price of fertilisers at present in use in Rhodesia, at £5 5s. per ton in Salisbury.

Taking this valuation, the nett profit per acre on the bats' guano plot works out at 8s.

(7) That the manurial dressing effected an improvement in the size of the cobs in all cases, and that on land receiving the complete dressing (No. 6), the proportion of good ears to nubbins was nearly double that on the unmanured land.

(8) That with the aid of fertiliser it may be possible to extend the planting season.

From the results obtained in this experiment we are taught that, large and profitable increases in the yield of maize are obtained on red land from the use of a complete fertiliser dressing. The fact that the experiment was conducted on 3rd year land—land which should still be in good condition—indicates that even more marked results may be reasonably expected on red soils which have been cropped for a greater number of years without the application of manure. Furthermore it has to be remembered that the beneficial effect of fertilisers containing superphosphate and sulphate of potash is not confined entirely to the first year after application.

An examination of Table I. shows that so far as this year's results are concerned, nitrate of soda did not have a very appreciable effect upon the yield, consequently it would appear advisable to reduce the amount of this constituent in the "complete dressing" from 75lbs. to 50lbs.

The "complete dressing" worthy of trial is therefore

Per acre	{	50lbs. Nitrate of Soda
		75lbs. Double Superphosphate
		40lbs. Sulphate of Potash

According to present prices in Salisbury, this dressing would cost 28/6 per acre. The mixture should be applied, at the time of planting, by means of a fertiliser attachment to the drill; failing this it may be applied broadcast and lightly harrowed in just before planting. It must not be forgotten that information given in this article, is drawn from the results of one year only, and that variations in seasons and other causes may necessitate a modification of some of these views. The "complete dressing," which is recommended for trial, should, therefore, not be used on a large area to begin with; the advice to the farmer for the present is to move cautiously and experiment for himself on similar lines.

Sub-Soiling by Means of Explosives.

During the last few years the practice of sub-soiling land by the use of explosives has become fairly general in parts of the United States of America, and very favourable reports have been received regarding the success of this practice. Recently, experiments on similar lines, more particularly in reference to orchards and vineyards, have been conducted in the Union of South Africa. On the 22nd May, a series of experiments were conducted on the Botanical Experiment Station, Salisbury, in co-operation with Mr. C. E. Wells and the Rhodesia Trading Company. The demonstration was fairly well attended, and a number of farmers took the opportunity of inspecting the process.

It should here be explained that the object of sub-soiling with explosives is to break up the lower layers of the sub-soil, and thus improve the absorptive power of the soil during the rainy season, and further, to so loosen the sub-soil that the roots of plants and trees may more readily penetrate to greater depths. It is claimed that by using explosives at the requisite depths the sub-soil will be fissured in all directions, and thus the soil will be aerated and plant food liberated at lower depths than would ordinarily be the case.

Should experience prove this to be the case it is obvious that deep rooting plants will be placed under much more favourable circumstances since the roots are enabled to penetrate more deeply and thus reach stores of plant food which they could not otherwise attain. Further, by aerating the soil more plant food is liberated and brought up to the surface soil in the capillary rise of moisture. The water holding capacity of the soil is also greatly increased, and thus all crops are better able to withstand periods of protracted drought.

The benefits of deep ploughing and sub-soiling are already widely recognised and the fact that the use of explo-

sives loosens the soil to a greater depth than any plough can reach indicates that the benefits derived from this process should be even more striking. The use of explosives in the manner described is particularly advocated on land with a heavy close subsoil, in stony ground or on soils which tend to form, after a few years, a hard plough-pan. The latter is frequently the case in orchards and in lucerne fields, where the action of irrigating water tends to pack the soil immediately below the depth reached by the ordinary shallow cultivator.

The first demonstration on the Botanical Experiment Station was given on virgin veld. A number of holes was drilled in a slightly slanting direction, to a depth of three feet, the holes being 9 feet apart each way. The charge consisted of a seven-eights gelignite cartridge which was of course connected with a detonator and fuse. In the majority of cases when the explosion occurred, nothing more than a slight heaving of the soil was noticeable, together with a small puff of dust around the aperture. In some cases, however, where the holes had not been so well drilled a considerable amount of surface soil was flung into the air. In all cases the earth was cracked and fissured in every direction around the hole. On digging out the holes, a cavity about eight to twelve inches in diameter was seen from which a number of fissures branched off. It should be noted here that the sub-soil of this land is of a hard red clay, and very impervious to plant roots.

The land on which these experiments were conducted is now being ploughed for the first time, and next season equal sized plots of various crops will be sown, partly on land thus treated and partly on land which has not been sub-soiled in this manner. A variety of crops, both deep and shallow rooted will be tested and the experiments should prove of extreme interest and value.

A second series of trials was conducted on a patch of three year old dryland lucerne which has never given very satisfactory crops. It is thought that the poor cropping power may probably be due to the hardness of the sub-soil and to the fact that the lucerne roots are unable to penetrate sufficiently deep. A check plot untreated on the same stand has been left

alongside the treated plot, and it is hoped to treat a further part of the stand in the same way just before the beginning of the rainy season.

To what extent the use of explosives will become general for ordinary farm crops in Rhodesia depends greatly on the cost of the operation. Under existing circumstances, the cost of explosives used on one acre of land when the holes are spaced nine feet apart each way is about £4 12s. 6d., but should the practice become general, it is not too much to hope that a cheaper explosive may be placed upon the local market as has been done elsewhere.

While it hardly seems probable that sub-soiling with explosives will at present prove profitable in Rhodesia for ordinary farm crops, there is every reason to believe that such will be the case when establishing orchards of either deciduous or citrus fruits, and should the experiments in Salisbury show a marked improvement with dryland lucerne when grown on land thus treated, it is by no means improbable that one of the main difficulties thus far experienced with lucerne in Rhodesia may be overcome.

With a permanent crop which remains on the land for five or ten years, an expenditure of about £5 per acre for sub-soiling is not excessive, provided always that sufficiently beneficial results accrue.

Utility Poultry Keeping for Amateurs and Beginners.

By "GALLINULE."

INCUBATORS.

At this period of the year, when artificial incubation is in full swing, a few words upon the incubator and its use may not come amiss.

In the first place, let a word of warning to the ignorant be given. Do not rush haphazard into the purchase of a machine. There are many good ones on the market, but whatever the manufacturers and their friends may say, there is no best incubator. Under certain circumstances one machine may be a failure, where another would succeed, and yet under still different conditions the successful machine might give poor results, while the unsuccessful one would hatch a high percentage.

As many purchasers have only the circulars of manufacturers to guide them in their choice, they are apt to be easily misled, and to make purchases in haste which they regret at leisure.

The question of choice does not so much depend upon the maker's reputation as upon the type of machine, for in one place a watertank machine is to be preferred, while in another a hot air hatcher will give better results.

In days to come we may learn much more about the art of incubation than we know now, for it is a regrettable fact that no thorough scientific study of artificial incubation and its problems has as yet been made, and many of the theories expounded by would-be experts are the wildest of wild

guesses, with hardly any basis in fact, and but slight corroboration on the side of physical and biological science.

It is only a little more than 30 years ago since Mr. Chas. Hearson patented his thermostatic capsule, a patent which I believe expired some years ago. Before 1880 eggs had been hatched by artificial heat in all sorts of weird contrivances, but the art was merely in its experimental stage. With the advent of the thermostatic capsule, artificial incubation became a commercial fact, and although hundreds of patents have since been granted to the inventors of incubator appliances Hearson's thermostatic capsule still holds its own, and only two innovations in incubation, or at most three, are of any value at all. The three machines which have introduced novelties are Cypher's, Lee's Triumph and the Petaluma, of which the second only is English, the first and last being American.

In Hearson's machine, the hatching heat is provided by a shallow tank of heated water, placed above the egg tray. The heat is kept up by a lamp, the flue of which passes through the water tank. The temperature is controlled by the capsule, which consists of two discs of copper, united at the edges and containing about half a teaspoonful of a mixture of spirits of wine and sulphuric ether. This mixture boils at or about 100° Fahr., varying according to the altitude. The capsule rests upon a hanging shelf, between the water tank and the egg drawer, and immediately above it a small tube passing through the water tank allows the passage of a steel rod. As soon as the temperature of the egg chamber reaches 100° the ether mixture boils, the capsule expands and the rod is lifted. This in its turn acts upon a lever which operates a damper upon the lamp chimney and allows heat to escape. By a sliding weight on the lever arm pressure is exerted upon the capsule, the boiling point is raised and the temperature regulated. Within certain limits this principle acts well, but when any sudden rise or fall of external temperature takes place, a corresponding change of temperature takes place in the egg drawer, and it is often hours before the equilibrium is automatically restored. For machines of this type a room with an even temperature is required, cool in the daytime, warm at night and although

ventilated properly yet not directly communicating with the outside air. In this room a constant temperature of 65° is the ideal. In fact a drive in a deserted mine at about 30 feet from the surface would suit a Hearson incubator splendidly, and under such circumstances it would hatch every fertile egg. In a room where the mercury rises above 90° or falls below 45° the Hearson is not to be recommended, and the same is true of all tank machines. In extremely high, low or variable temperatures recourse must be had to a hot air machine of the Cypher's type. In this machine, heated air takes the place of hot water, there is little or no draught and the natural conditions under the hen are very nearly duplicated. The heat is regulated by a thermostatic bar consisting of strips of two different metals having different co-efficients of expansion. As these metals are firmly soldered together at their extremities as soon as expansion takes place the straight bar becomes a bow with the convexity upwards, and in a manner similar to that of the Hearson's incubator. A damper is by this means raised from the lamp. Regulation of temperature is very exact by this means, and as the air percolating through the egg drawer creates no draught the eggs dry down naturally. In watertank machines a constant current of air is passing over the eggs and drying down proceeds at a great rate. This has to be compensated by the provision of a water tray below the egg drawer which allows the entering air to become more or less saturated. With regard to this water tray a great deal of nonsense is talked.

Hearson's machine has a very quick draught, and would dry the eggs down far too quickly were it not for the provision of moisture, and thus one can hardly err on the side of over-provision of water. Now, successful incubation depends in a great measure upon the regular drying down of the egg, and in watertank machines this is more easily under the control of the operator. On the other hand it is very rarely that the eggs dry down too quickly in the Cypher's incubator, and still more rarely do they dry down too slowly. The quick draught of tank machines renders the water tray necessary, and the quick draught itself is necessary to prevent overheating. Some time ago two poultry experts, both prominent men, were tearing each other to pieces in the

columns of a contemporary, over this water tray business. The one insisted that the tray should always be full of water, and the other that water should be supplied according to indications of the hatching egg. One who uses Hearson's insisted upon plenty of water. This is quite right for Hearson's with its quick draught. The other man who uses a Tamlin's (a watertank machine with slower draught) urged that water should be supplied only as needed, and that the indications provided by the egg should govern the water supply. He also was right as touching his machine. This question of moisture *versus* non-moisture is a mighty bone of contention in the profession. The machine itself must decide in every instance.

Let us now compare the incubators most used in South Africa. Hearson's, which is generally held to be one of the best tank machines, will not hatch well at temperatures exceeding 90° or lower than 45°. It does not hatch well in the steamy low country heat of January and February. It works better on the highveld than in the bush during summer. It requires to be well housed in an airy room, not exposed to any extremes of heat or cold. It is an expensive machine and consumes a great deal of oil. In its justification must however be urged that it is thoroughly well made and will last for ever. The thermometer must be withdrawn for examination and the drying box is not connected with the egg chamber. This latter is a defect of all tank machines, which are only variations of the Hearson idea.

Tamlin's machine is of similar construction to Hearson's, and is recommended by its low first cost, its economy of oil, the use of a very excellent self-supplying lamp, and the ease with which the thermometer may be inspected. It hatches pretty nearly, if not quite as well as Hearson's, but is not so durable. Tamlin's claim for the extra sensitiveness of his capsule is not borne out by my experience, and in other matters it is subject to the same defects as Hearson's, though it responds to change of temperature slightly more readily than does Hearson's with its larger tank, but is also liable to cool down more rapidly when the lamp fails.

Cypher's incubator seems to require an expert operator to get the very best results, but gives good hatches in the hands

of any careful novice. The eggs are always visible, and the drying box connected with the egg tray so that newly hatched chicks do not run the risk of a chill. It uses more oil than Tamlin's but less than Hearson's; responds quickly to a change of temperature, and gives fair hatches anywhere and at any season of the year. Its drawbacks are that the diaphragms through which the air percolates into the egg chamber are apt to be clogged by dust, and in very rainy weather it does not dry down its eggs as well as it might. The thermometer is also rather awkwardly hung. The great objection to hot air machines, however, is that if the lamp should unfortunately go out there is no reserve of heat such as a watertank to keep the eggs from getting chilled. Lee's Triumph is a new departure in which the water tank is replaced by a system of tubes. It is very economical of oil, and in England has already gained a very high reputation. South African reports are also in its favour, but seem to indicate that it is a machine with a personality which requires to be thoroughly understood before it gives its best results.

The Petaluma is an American hot-air machine which instead of letting off heat by means of a damper, raises and lowers the flame directly. I shall be glad to hear from any reader who uses this machine what success he has had with it. The regulating device certainly has a future before it.

Before closing, I may say that if any reader desires advice on incubators or incubation, I shall be pleased to answer immediately any communications addressed to me under care of the Editor. In the next issue I hope to be able to deal with the practice of incubation.

Notes on Bee Keeping.

By FREDERICK SWORDER.

By the time these lines appear in print our winter will have passed and all lovers of nature will be welcoming the advent of spring. More especially will this be the case with bee-keepers who, having the industry at heart, have, previous to the approach of the chilly nights studied the comfort of their bees by placing extra wrappings above the brood chamber. This additional care is always well repaid, for where bees have gone into winter quarters with an ample supply of food and this extra covering they invariably build up more quickly in the spring than those stocks which have been neglected, because the conditions for the preservation of bee life have been more favourable. In the winter months greater heat is conserved in strong stocks than in weak ones, therefore proportionately less food has been consumed, while at this season the queen is also induced to lay eggs at an earlier period. Again, the larger population of the hive is in readiness to minister to the wants of the new generation now coming into being by seeking and gathering the increasing flow of nectar and pollen so soon to bud forth on many of our trees in the bush.

Generally speaking, it can be taken for granted that there are to be found in Rhodesia numberless swarms of bees easily obtainable, yet these are not all of the same temperament, some strains being decidedly unsuitable for domestication, while others again will be found to be very docile, that is, provided proper precautions and common-sense treatment are adopted. Such being the case, the thoughts of those who may be interested and are also anxious to make a start in the industry will naturally turn to the all important question, "What kind of hive shall I

purchase, that will be most suitable for my requirements and this particular district?" On this subject, and it is an important one, opinions, so far as South Africa is concerned, are divided; some bee-keepers maintain that the British "Standard" hive is very suitable for our purpose, others adhere to the Langsbroth hive, furnished with Hoffman frames, which is an old pattern and well tried, while we read of the Dazenbaker hive possessing several good points.

I might mention here that in the January number of the *South African Bee-Keepers' Journal* there appeared particulars of an essay competition open to all bee-keepers of South Africa, with a prize of £3 3s. to the writer of the winning essay on each of the following subjects: Essay 1 "Of what internal and external dimensions should the brood chamber of the South African hive be?" Essay 2 "What is the best type of hive for South Africa?" Then follow the conditions relating to these essays. Needless to say the judges will have no light task in making their awards, while if suitable, the winning essays, together with the results, will be published in the *South African Bee-Keepers' Journal*.

Speaking without prejudice, personally I prefer the British "Standard" hive, as it possesses so many good points. Having used it for over eleven years in South Africa, I can confidently recommend it as quite suitable for securing either comb or extracted honey. The hive itself is substantially constructed of well seasoned timber, and a great point in its favour is its simplicity combined with comfort for the bees. The dimensions of the frames which carry the combs, *i.e.*, the internal fittings of the brood chamber, are well adapted for general use, being easily handled, while the crate or rack which is placed above the brood chamber in which is stored the comb honey in the form of 1-lb. sections, is eminently suited for its purpose. A further point in its favour is that there is plenty of room in the upper storey where the crate of sections can be well covered on all sides, also above, with warm clothing. I strongly advocate this principle of warm porous clothing, even in the summer months, above the section crate, for it has been proved over and over again that any hive not possessing this advantage will not give such satisfactory results,

The dimensions of the British "Standard" Frame are:—top bar, 17"; bottom bar, 14"; end bars, $8\frac{1}{2}$." These measurements were adopted by the British Bee-keepers' Association, in 1874, and have not since been altered. By the insertion of inside walls in the upper storey, or lift of the hive, these being usually supplied with the best types of British hive, honey stored by the bees in shallow frame combs for extracting purposes, can also be secured. These shallow frames are supported in the lift by these inside walls, which latter must and can be easily removed when working the hive with a rack or crate of sections. Naturally this plan in the first instance adds a few shillings to its cost, which with some is a consideration, yet it saves the extra expense of purchasing later a duplicate shallow frame lift. The hives in my own special apiary are on this system. Yet another important item is that the floor on which the hive rests, is made fast to two strong girders, to which can be fastened at a trifling cost, four legs. These legs must stand in tins of water, since Rhodesia is cursed with such an innumerable quantity of ants of many descriptions that it would be quite impossible to keep bees without these essential adjuncts.

I have handled very many stocks of bees in hives of the American Langstroth pattern fitted with Hoffman frames. This type of hive is simple in construction, operated with comparative ease and cheaper than the British, but the cheapest hive is not always the best. Neither hive is perfect, but what agricultural implement is? The dimensions of the "Standard" frame of America are: Top bar, $19\frac{1}{8}$ in., bottom bar, $17\frac{5}{8}$ in., side bars, $9\frac{1}{8}$ in.

The Dazenbaker hive, another American pattern, in its present form has been on the market since 1895. At first it was not favourably accepted by bee-keepers, but it has been recognised by them that it possesses merits peculiar to itself, in that the frames in the brood chamber hang on two central pivots attached to the side or end bars, whereas in both the British and Langstroth hives the brood frames are supported by the top bars only. A further advantage claimed for the Dazenbaker system is that the ends of each frame touch one another, thus a warmer brood chamber is the result; hence also the phrase: close-end-reversible-centrally-

supported. The dimensions of this frame are: top and bottom bars $16\frac{3}{4}$ inches, depth $7\frac{1}{2}$ inches. It will be seen that this frame is very shallow in depth. The inventor noticed that an ordinary colony of bees stored about two inches of honey above the brood in a Hoffman frame, and he at once decided to make his frame $7\frac{1}{2}$ inches in depth instead of $9\frac{1}{8}$ inches, basing his arguments on the fact that these two inches of honey would be stored where bee-keepers wanted it, viz., in the sections above.

All the above-mentioned types of hive can be obtained in South Africa. Whichever type of hive is selected at the commencement it is strongly advisable to adhere to that particular pattern ever after, for in such case all floors, brood chambers, lifts, roofs and internal fittings are interchangeable. To the novice just commencing, this plan may not appear of much importance, but as he gains experience and his apiary grows, he will undoubtedly appreciate this great advantage.

(To be continued.)

Resume of Investigations in the Government Veterinary Laboratory, 1911

(Continued).

QUARTER EVIL AND TRYPANOSOMIASES.

By LL. E. W. BEVAN, M.R.C.V.S., Government Veterinary
Bacteriologist.

QUARTER EVIL

Local History.—This disease was first recognised in Southern Rhodesia early in June 1911, when it was reported from the Redbank and Insiza Districts in Matabeleland.

Concerning these outbreaks, Government Veterinary Surgeon Hooper-Sharpe supplies the following:—

Field Observations.—"Mr. O—— of Redbank, reported to the Veterinary Department that he had lost three animals within two days, from what he considered was snake bite, but which, on investigation proved to be a form of quarter evil.

The districts of Redbank and Insiza are noted for snakes, some forty animals having died during the previous twelve months in the Redbank district alone, from what was thought to be snake bite, but I think from the description of the post-mortem lesions of some of the cases, that in many instances the cause of death was "black quarter."

Certain natives of the Insiza District claim to recognise the disease and call it "Umahamba Mbitjana" but this name, according to the Native Commissioner of the district refers to a similar disease in sheep but not in cattle. I have not found any white man who has seen the disease before in this country, although there are many who have had experience of it in the Cape Colony.

Occurrence.—Up to the present it has only been reported from the two districts mentioned which, "as the crow flies"

are about fifty miles apart. No connection between the outbreaks in the two districts can be traced, and no explanation as to the origin of the disease can yet be offered.

Conformation of the Country.—At Insiza, the general formation of the country where the infected farm is situated, is undulating and in places mountainous. The soil of this farm consists of red loam and black vlei and does not average more than three feet in depth, with a subsoil of decomposed granite. The farm is well watered with water from permanent springs; grazing is good.

At the Redbank outbreak the country is low and flat. The Gwaai River separates the two farms on which the disease occurs, and deaths have occurred among cattle which have regularly grazed on both banks of the river. Here the formation of the country is a mixture of sandstone basalt and granite. The soil is red and white sand and black vlei. Most of the grazing is sandstone veld with some bush and sweet veld.

In both instances (Redbank and Insiza) the grazing is rich; cattle improve fast in condition after the winter grass, but never show the emaciated condition that is seen in cattle on many other farms in the country in the winter.

Time of Year when most Prevalent.—Contrary to what pertains in England and other countries where the disease is most active in the warmer months (May, June and July), that is spring and early summer, in this country it has occurred in late autumn and early winter (June and July). This may perhaps be accounted for by the fact that at this time of the year the cattle are at their best. No deaths occurred at either outbreak after early August, although both young and old stock were running on infected veld.

Animals Affected.—Up to the present the disease has only been noted in cattle, and the average ages of the animals affected being two years; the youngest animal was 18 months old, and the oldest, a native cow, over four years of age, having her second calf running at foot.

Symptoms.—These both ante and post-mortem are similar to ordinary quarter evil. The disease runs a very rapid course, ending fatally within 12 to 24 hours from the time when clinical symptoms are first observed.

Ante-mortem.—The sick animal is noticed to be lame or to be continually lying down. It is dull and has no appetite. On examination a diffuse swelling is found, either on the fore or hind quarter, extending inside the forearm or thigh. On palpitation of these swellings some slight crepitation is met with, but the skin over the swelling does not show the parchment-like and dried-up condition found in ordinary quarter evil. In no instance during life has there been noticed any fluid extending from the swollen surface, but in one instance, 24 hours after death, a slight blood-stained exudate was observed. In this case the hind quarter was effected, and the animal was badly “blown up.”

Post-mortem.—Blood-stained froth escapes from the nostrils. The emphysematous swelling is well marked, and, after some time, blood-stained exudate moistens the skin over the muscle lesion. On cutting through the skin the subcutaneous tissues and those surrounding the lesion are saturated with a thin watery and blood-stained fluid. The affected muscles on the surface are dry and porous, and of a dark red colour; deeper down they are of a lighter or dirty-brown colour, while deeper still they are pale and look as if the animal had been bled. They crackle slightly on palpitation and have a characteristic foetid odour; when cut and squeezed a blood-stained froth escapes from them.

The lymphatic glands in the neighbourhood of the tumour are enlarged and hæmorrhagic. The liver shows marked fatty degeneration and the abdomen is much congested.”

LABORATORY OBSERVATIONS.

Initial Experiments.—Specimens of diseased muscle were forwarded by G. V. S. Hooper-Sharpe to the Laboratory. These were found to correspond with the usual appearances of quarter evil muscle as regards colour, smell and hyperæmia, but differed in the absence of any marked emphysema or sponginess. Scrapings of the muscle when examined under the microscope were found to contain bacteria which conformed very closely with the standard description of *B. chauvoei* in that bacillary, lemon-shaped and tennis-racket-shaped organisms were met with.

An emulsion of muscle was prepared and inoculated into

rabbits, sheep and a yearling bull. (Guinea pigs were not available).

The *sheep* died with lesions in the muscles of the inoculated quarter similar to those of the muscle sent.

The *bull calf* became very lame and a swelling developed at the seat of inoculation; but the animal recovered.

The *rabbit* died with characteristic lesions.

Sub-inoculations were made from this rabbit into a sheep, which died with typical lesions of quarter evil—that is to say, in this case, the muscle lesion was spongy, emphysematous and had a sour smell.

A second (sub-inoculated) *rabbit* died from accident, but the lesions were well advanced and would probably have caused death.

Cultural experiments were made under aerobic and anaerobic conditions. No growth could be obtained in air, but under anaerobic conditions (in Buchner's tubes) a growth occurred, which, however, did not correspond with standard descriptions.

Morphology.—Preparations made from the lesions of the above, when viewed under the microscope, revealed

- 1 Threads of bacilli more regular and smaller than malignant oedema. One thread was noted to be made up of 15 segments, the average number of segments in a thread being 4 or 5. The bacteria stained well with Giemsa but did not retain Gram.
- 2 Single bacteria more slender than the above, some beaded, and others resembling "pasteurella." Other slender bacteria occurred in pairs, the individuals lying at angles to one another.
- 3 A few sporulating organisms, tennis-racket-shaped.

IDENTITY OF THE RHODESIAN DISEASE

From the commencement the Veterinary Surgeons investigating the disease in the field, Messrs. Edmonds and Hooper-Sharpe, were struck with certain unusual features and expressed a doubt as to whether they were dealing with quarter evil *per se*, or a Rhodesian form of it modified by environment.

The unusual characters to which they drew attention were

- 1 The time of the year when the disease occurred (late autumn or early winter).
- 2 The age of animals attacked. (No affected animals were less than 18 months old).
- 3 The susceptibility of horses and donkeys.
- 4 The frequent absence of emphysema in the affected muscles, and the unusual surface appearance of the lesions.

In addition, the early Laboratory results, namely,

- 1 The susceptibility of the rabbit.
- 2 The recovery of the ox.
- 3 The morphology of the organism complicated rather than assisted the diagnosis.

Cross Immunity Tests.—These uncertainties were of practical importance because the question arose as to the desirability of immunising animals on the infected areas. The Government Veterinary Bacteriological Laboratory, Pretoria, issues a black quarter vaccine, and it was suggested that this might be applied as a preventative; but when it became doubtful whether the local disease was true quarter evil the wisdom of such a proceeding was questioned since it involved the risk of introducing, by means of animals dying under inoculation, a disease to a country thought to be free from it.

For this reason the following experiments were conducted at the Laboratory:—

Experiments to determine whether the black quarter vaccine issued by the Bacteriological Laboratory, Pretoria, affords immunity against the form of quarter evil occurring in Matabeleland.

Vaccine—as above stated. In order that a smaller dose could be used for sheep, the powder was rubbed up with exactly twice the usual quantity of water.

Dose—2 c.c. of above for cattle

 " 1 c.c. " " " sheep

(injected in front of the shoulder).

Virus used to test the efficiency of the vaccine was an emulsion of muscle tissue from an ox which had died with typical lesions of the disease at Insiza.

In the course of these experiments the mistake was made of introducing the test virus too soon after the injection of vaccine, and before full immunity could have been derived. The results do not appear to have been influenced thereby.

Animals Vaccinated.—1 yearling half-bred shorthorn steer, 1 ewe in very fat condition—4 teeth.

Controls.—1 yearling half-bred shorthorn steer, 1 ewe in good condition.

These animals were selected as comparing as nearly as possible in age and condition with the vaccinated animals.

EXPERIMENT NO. 1.

Subject—Steer, half-bred shorthorn, in fair condition, 2 teeth.

Vaccine—Transvaal black quarter vaccine.

Dose—2 c.c. emulsion (as explained above).

Date—5-8-II.

Date.	Temperature.	Remarks.
5-8-II	—	Vaccinated.
7-8-II	100.4	
8-8-II	101.2	Inoculated with local virus in near hind leg.
9-8-II	105.2	Slightly lame.
10-8-II	102	Leg swollen. Very lame.
11-8-II	101.6	Swelling reduced.
12-8-II	101.6	
13-8-II	102	
14-8-II	101.4	
16-8-II	101.6	
17-8-II	101.2	

Control.—Subject—Steer, 3-year-old half-bred shorthorn.

Date.	Temperature.	Remarks.
8-8-II		Inoculated with 2 c.c. emulsion of muscle juice of dead ox at Insiza into the muscles of the leg.
9-8-II	103.2	Near hind leg immensely swollen,
10-8-II	103	animal only moves with great
11-8-II	101.8	difficulty.

Date.	Temperature.	Remarks.
12-8-II	102.4	
13-8-II	102	Swelling reduced.
14-8-II	102.4	
16-8-II	101.2	
17-8-II	101.4	

Remarks.—The vaccinated animal responded to inoculation with infected muscle juice, with a very much more acute temperature reaction than the untreated animal; but the local reaction in the case of the vaccinated animal was far less severe than in the unvaccinated one, in which the limb became enormously enlarged (as shown in the photograph) and did not regain its normal dimensions for some days. It was, however, a matter for surprise that the non-vaccinated animal did not succumb.

EXPERIMENT NO. 2.

Subject—Sheep (fat-tail)

Vaccine—I c.c. of emulsion (half strength) of Transvaal black quarter vaccine.

Date—5-8-II

Date.	Temperature.	Remarks.
5-8-II		Vaccinated.
7-8-II	101.4	Inoculated with virulent muscle juice
8-8-II	100.6	Slightly lame.
9-8-II	103.6	
10-8-II	102.2	
11-8-II	101.8	
12-8-II	103.4	
13-8-II	103	
14-8-II	102.8	
15-8-II	103.6	
16-8-II	101.4	
17-8-II	101.8	
18-8-II	103.2	
19-8-II	102.4	
20-8-II	101.8	
22-8-II	101	
23-8-II	101.8	
24-8-II	100	
25-8-II	100.8	
26-8-II	101.4	
27-8-II	101.6	

Control.—Subject—Sheep (fat-tail)

Virus—2 c.c. virulent emulsion of muscle tissue.

Date.	Temperature.	Remarks.
8-8-II		Inoculated as above.
9-8-II	101.4	Unable to stand, leg and vulva swollen. Died during the night.

Remarks.—The vaccinated sheep reacted slightly to inoculation. The inoculated leg became slightly swollen and painful, but soon regained a normal condition. The animal did not appear to be seriously inconvenienced thereby and fed quite regularly throughout.

The *untreated* sheep, however, died within 24 hours with immense swelling of the limb and characteristic oedematous condition of the vulva, tail and perinoeum.

Conclusion.—1 That the Transvaal black quarter vaccine, in suitable doses, can be safely applied to sheep.

2 That this vaccine has the power to modify the reaction due to the inoculation with the local strain of virus.

Conversely, experiments were made to test whether an animal immunised with a Rhodesian vaccine would resist inoculation with a fatal dose of virulent muscle obtained from the Transvaal.

Vaccine.—Muscle from a sheep dead as the result of inoculation with muscle-emulsion from an ox dead at Insiza, was dried in a hot oven. It was ground to a fine powder, mixed into a paste with water, spread on glass plates and exposed to a temperature of from 85° to 90° C for six hours. It was then scraped off the glass and stored in sterile bottles.

Virus.—The virus was kindly sent by Dr. Theiler in the form of pieces of black quarter muscle and was labelled "1st generation."

EXPERIMENT NO. 3.

Subject—Red and white hornless sheep.

Vaccine—Rhodesian vaccine inoculated near tip of tail.

Date.	Temperature.		Remarks.
	a.m.	p.m.	
28-10-II	101.6		Inoculated.
30-10-II	103.2		No local changes.
31-10-II	102.6	104	
1-II-II	101.6	104	
2-II-II	101.8	101.6	
3-II-II	102.2	102.4	
4-II-II	101.2	102.4	
5-II-II	103.6	103	
6-II-II	104	103.2	
7-II-II	103.4	103.4	
8-II-II	103	103	
9-II-II	103.3	102.8	
10-II-II	102	102.2	
11-II-II	102	101.6	
12-II-II	101.2	101	
13-II-II	102.4	102.6	
14-II-II	101.6	102.6	
15-II-II	101.4	101.6	Inoculated 2 c.gm. Rhodesian vaccine.
16-II-II	102.2	102.6	
17-II-II	101.4	102.6	
18-II-II	101.6	102.8	Tested $\frac{1}{2}$ gm. Transvaal Q. E. muscle powder in emulsion. No re-action.
19-II-II	101.8	102.8	
20-II-II	101.8	108.8	
21-II-II	101.4	101.8	
22-II-II	101.2	102	
23-II-II	108	108.4	

Control.—Subject—Half-bred Persian ram.

Virus— $\frac{1}{2}$ gm. Transvaal quarter-evil muscle powder in sterile water.

Date.	Temperature.		Remarks.
	a.m.	p.m.	
18-II-II		104	Inoculated inside right thigh.
19-II-II	105.8	106.2	Swelling at seat of inoculation.
20-II-II	101	Dead.	Swelling extending down to hock and along abdomen.

Conclusions.—1 That a vaccine can be produced by the method of Kitt from the muscle of an animal dead of the Rhodesian form of quarter evil.

2 That such a vaccine, in suitable doses, can be applied with safety to sheep, and

3 will confer immunity against a fatal dose of infective muscle of an animal dead of Transvaal black-quarter.

In order to elucidate the problems which had presented themselves in studying the Rhodesian disease in the field and in the Laboratory, further experiments were conducted.

(a) To determine the susceptibility of the rabbit to the Rhodesian virus.

Note.—(In the recognition of "Quarter Evil" this is considered by many authorities an all-important feature in diagnosis. Friedberger and Frohner state (Veterinary Pathology (authorised translation) Infective Diseases of Animals) "In order to be able to positively distinguish anthrax from quarter evil, we should inoculate simultaneously a rabbit and a guinea-pig. If only the guinea-pig dies, the disease is quarter-ill; if both die, it is anthrax."

Muir and Ritchie (Manual of Bacteriology, 1899, p. 401) say "Rabbits are practically immune to this disease, while they are comparatively susceptible to malignant oedema."

McFadyean teaches that "the guinea-pig is the only small animal readily infected."

Nicolle & Remlinger (Traite de Technique Microbiologique) "Le lapin est assez resistant a l'infection intramusculaire; mais, en usant de certains artifices.... (injection concomitante d'acide lactique, de methylamine, de cultures vivantes on steriles de *b. prodigiosus*; ou bien inoculation au sein d'une ecchymose.... etc.) on arrive aisement a le faire périr."

Law (Text-book of Veterinary Medicine, Vol. IV. 222) expresses the same opinion.)

EXPERIMENT No. I.

Subject—Rabbit 41 (previously used for rabies experiment)

Virus—5 c.c. muscle juice from ox dead at Redbank, Mata-beleland, 10-6-II. Inoculated into muscles of thigh.

Date—12-6-II.

Result—Died 15 6-II. Characteristic lesions of quarter evil.

EXPERIMENT No. 2.

Subject—Rabbit No. 47.

Virus— $\frac{1}{2}$ c.c. muscle juice from rabbit No. 41.

Date—15-6-II.

Result—Died from accident 19-6-II. A typical local lesion at site of inoculation. Would probably have caused death.

EXPERIMENT No. 3.

Subject—Rabbit.

Virus—I c.c. emulsion of dried quarter evil muscle injected into the muscles of the thigh.

Date—16-II-II at 12.30 p.m.

Result—*Local lesion* extending down the right leg and along the right side of the abdomen. A quantity of gas under the skin, having a putrid odour. On removing the skin the underlying tissues had the appearance of black currant jelly. The muscles were similarly coloured, soft and gelatinous, but not spongy or notably emphysematous. Abdominal organs apparently healthy. Heart-sac shewed hæmorrhages, and a quantity of fluid was encountered in the sac; the blood was black but not coagulated.

Microscopic—The muscle juice contained vast numbers of organisms, chiefly bacilli 4 to 5 microns long, others thicker and longer, possibly due to the union of two segments. Sporulating forms plentiful. The majority of spores situated terminally giving rise to dumb-bell types and typical tennis racket types. A few clostridium types; other spores lying free. A few short chains, these very rare. Heart blood, a few isolated bacilli and one long chain encountered.

Control.—Subject—Guinea pig.

Virus—I c.c. emulsion of quarter-evil muscle injected into the muscle of thigh.

Date—16-II-II at 12.30 p.m.

Result—Oedematous swelling, hot and painful, at and around seat of inoculation, 17-II-II. Died at 2.30 p.m. *idem*. Lesions and organisms typical of quarter evil.

EXPERIMENT NO. 4.

Subject—Rabbit.

Virus—I c.c. fresh tissue juice expressed from quarter-evil lesion of a goat, containing bacteria with terminal spore (tennis racket shape).

Date—5-I-12 at 3.45 p.m.

Result—No apparent effect.

EXPERIMENT No. 5.

Subject—Rabbit (white).

Virus—2 c.c. tissue juice expressed from lesion of goat 4R dead 10-I-12 of typical quarter evil. Juice used 36 hours after death of goat. Injected into muscles of right thigh.

Date—12-I-12 at 12.50 p.m.

Result—13-I-12, swelling, discolouration and crepitation at and around seat of inoculation. 14-I-12, found dead. Typical lesions and sporulating organisms (tennis-racket-shape) of quarter evil.
Cultures made.

Conclusions.—I That the rabbit offers resistance to the organism of Rhodesian quarter evil when this is obtained from an infected animal before or immediately after death, but can be infected more readily when the infective material is not "fresh."

2 Therefore, when material is taken from suspected cases of quarter evil in the field, and delay occurs before it can be used at the Laboratory, the susceptibility of the rabbit does not constitute a reliable test for purposes of differential diagnosis.

(b) To test the susceptibility of equines.

Note.—(The general opinion is that equines possess a marked resistance to quarter evil. Law (Veterinary Medicine) states that "horses, asses and white rats have only a circumscribed swelling at the seat of inoculation."

Friedberger and Frohner (Veterinary Pathology, Infective Diseases of Animals) say that it affects horses, but very rarely.

McFadyean expresses the opinion that nearly all the cases which are said to have been observed abroad in the horse and pig, are open to doubt.

Levens, of Goch, recently published in the *Berliner Tier. Woch.* a detailed description of two cases of quarter ill in the horse, and about the same time the disease was stated to have occurred in horses in a quarter ill district in Germany to such an extent as to necessitate official action.

During the past year, also, cases have been reported from Cape Colony.)

The following experiments have a bearing upon the question.

EXPERIMENT NO. 1.

Subject—Very old gelding donkey.

Virus—Inoculated inside of left thigh with emulsion of quarter evil muscle (2 gms.)

Date—20-II-II at 11 a.m.

Result.—21-II-II. Left leg and thigh much swollen. Oedema extending down to foot. Symptoms increasing daily until death, 24-II-II. The animal could only move with the greatest difficulty and preferred to remain lying down. On 23-II-II the donkey appeared about to die but rallied and showed some slight improvement on the following day. At the same time a blood-stained serous fluid exuded through the skin over the lesion saturating the ground, so that it was considered advisable to destroy the animal in order to avoid serious contamination of the stables. On post mortem examination the infected muscles showed characteristic features of quarter evil, and were heavily charged with gas, having a typical sour smell.

EXPERIMENT No. 2.

Subject—Young donkey gelding.

Virus—25 gm. powdered Rhodesian quarter evil muscle, into muscles of thigh.

Date.	Temperature.		Remarks.
	a.m.	p.m.	
22-I-12	100.2	103.4	Inoculated 11 a.m.
23-I-12	103.4	103	Swelling around seat of inoculation. Dull and off feed.
24-I-12	101	102.6	Swelling increased, extending to hock.
25-I-12	101.8	102	Swelling increased, extending to foot.
26-I-12	102.4	102.4	Limb enormously swollen. Upper limit sharply defined, resembling "purpura."
27-I-12	104	103.4	
28-I-12	103	103	Swelling less.
29-I-12	102	102.4	
30-I-12	101.2	—	Swelling reduced, animal bright and feeding well.

Conclusions.—That the donkey offers considerable resistance to Rhodesian quarter evil, even when artificially infected with large quantities of virus.

CHARACTERISTICS OF THE ORGANISM.

I.—*In natural cases, i.e.,* in preparations sent in from the field.

It is customary in this country to forward for diagnosis blood and spleen smears from dead cattle in order that African Coast Fever may be detected by the presence of Koch's bodies or *T. parvum*.

It thus happened that a smear made from the spleen of a half-bred Friesland heifer, which had died at Redbank, was sent to the Laboratory for examination and raised suspicion of quarter evil. In it, among numerous organisms undoubtedly associated with putrefaction, were a few short bacteria about 3 m. long having a terminal oval spore and presenting a characteristic tennis-racket appearance. Free spores were also plentiful and not a few thin bacilli about 4 m. made up of a faintly staining protoplasm and having a small terminal spot which retained the chromatin elements of Giemsa's stain and which was possibly an embryo spore, were present.

The suspicions of quarter evil were notified to G. V. S. Hooper-Sharpe, who simultaneously diagnosed the disease from the clinical symptoms and lesions of cases in the field.

Preparations from the muscle lesions of further cases shewed the tennis-racket-shaped organism and the bacilli as a constant feature, with or without the bacillus of malignant oedema and organisms of putrefaction.

2. *Laboratory Inoculations* with infected muscle juice or suspension of powdered muscle had given rise to certain symptoms indistinguishable from quarter evil, and in animals so affected the following organism has been encountered:—

1. Bacteria—from 3 to 4 m. long and about 1 m. in breadth. Ends convex. Staining readily with aniline dyes.

2. Longer bacteria—4 to 6 m. long and .75 m. wide, generally in pairs, and set at an angle to each other.

3. Bacteria about the same size as above, staining more faintly—skeleton forms.

4. The above, having at their ends a dark staining body—possibly an embryo spore.

5. The above staining irregularly—beaded.

6. Bacteria (No. 1 type) containing a central oval spore which does not distend the envelope. So-called *Clostridium* type.

7. Bacteria, having a terminal oval spore—so-called tennis racket shape.

8. The above types set end to end—dumb bell type.

9. Free spores.

Staining reactions.—These bacteria stain readily with the common basic aniline dyes.

Those of the first type shew a disinclination to release the stain by the method of Gram, the other types may be said to be Gram negative.

(*Note.*—Authorities differ with regard to the reaction of *B. chauvœi* to Gram's stain. McFadyean, Muir & Ritchie,

Annett and other English experts teach that it is Gram negative, while Nicolle & Remlinger write: "Le b. chauvæi se color bien par les couleur basiques d'aniline *et prend le Gram*," an opinion which is held by other teachers at the Pasteur Institute, Paris. Friedberger & Frohner are also of opinion that "they can be stained wiith Gram's solution.")

Distribution of the Organism in the tissues.—In the muscle lesions or in the oedematous fluid of the affected part all forms of the organism are met with.

In animals killed when the disease has far advanced, or examined immediately after death, the heart's blood may contain bacillary types. "Tennis-racket" forms have also been encountered.

Similar forms may also be met with in the liver, spleen, kidney and mesenteric glands.

When the foot of the dead animal is placed in the incubator for some twelve hours after death, the spore forms are met with in great numbers.

Thus it would appear that the above organism, having the characteristic features of *B. chauvæi* is to be met with in all natural and artificial cases of quarter evil in this country. It is, however, seldom met with alone but is generally associated with other microbes which complicate diagnosis, and render its isolation for the purpose of obtaining pure cultures extremely difficult.

This has always been recognised and has been a constant source of error in the study of quarter evil. French authorities (Leclainche, Vallée, Nicolle and Remlinger) drew attention to the frequent complication by the malignant oedema organism and consider much of the work on "symptomatic-anthrax" has been invalidated by neglect to recognise this fact. It is taught at the Pasteur Institute that one may "sow *B. chauvæi* and reap Pasteur's vibrio" (*i.e.* malignant oedema bacillus).

Recently Baldrey has drawn attention to an organism—a cocco-bacillus toxic to rabbits, guinea pigs, Indian sheep and cattle, and causing symptoms which might be mistaken for black quarter.

In our own endeavours to cultivate *B. chauvæi* from Rhodesian cases we have not experienced so much difficulty with the bacillus of maglinant oedema as with a bacillus which grows equally well under aerobic and anaerobic conditions, and presents during its growth all the types characteristic of *B. chauvæi*, including the spore forms resembling tennis-rackets.

It produces gas having an unpleasant sour odour, and its spores are very resistant to heat, so much so, that the attempt to separate it from *B. chauvæi* by heating has invariably failed.

It is non-pathogenic to rabbits, guinea pigs, sheep and goats, either alone or with lactic acid, but there is some evidence that when it is inoculated into them a degree of immunity is afforded against subsequent inoculations with powdered quarter evil muscle.

At the time of submitting this report this interesting organism is being further investigated. It would appear from the experiments at present in hand that the conditions which conduce to the development of *B. chauvæi* in the tissues are favourable to the growth of other organisms, which, in certain circumstances, are capable of producing morbid effects.

TRYPANOSOMIASIS.

The work in hand at the beginning of the year had to be discontinued in order that more time might be given to other matters. Such rapid strides have been made during the past year in the study of these diseases that the observations then in hand have become 'ancient history' and scarcely worthy of record.

The Trypanosomiasis then under consideration were :—

1.—The "fly" disease of cattle, caused by the trypanosome now included by Bruce in the group to which he gives the name *Trypanosoma pecorum*.

2.—The human Trypanosomiasis of Northern Rhodesia, caused by a trypanosome to which the name *Trypanosoma rhodesiense* has been given.

3.—A strain of human Trypanosomiasis (sleeping sickness) originally from an European who contracted the disease on the Lualaba in the Congo territory.

A few points concerning the above may be discussed.

Trypanosomiasis of Animals.—The causal organism of the “fly” disease of animals, as it occurs naturally in the Hartley and Lomagundi districts, has been included by Bruce in the group to which he has given the name *Trypanosoma pecorum*. While the endeavour to simplify the classification of South African trypanosomes is to be welcomed, it does not appear wise to establish a classification on morphological features alone, inasmuch as the method of transmission is of greater practical importance than the shape of the organism.

Bruce himself writes “When we have to do with *Trypanosoma gambiense* we at once know that man is susceptible, that the carrier is *Glossina palpalis*, and that we must keep ourselves out of the area of distribution of this fly if we would escape infection. If it is *Trypanosoma brucei*, then we know man is not susceptible, but that we must keep our horses, cattle and dogs out of the area of *Glossina morsitans*.”

Under the species *Trypanosoma pecorum* are included:—

T. dimorphon (Dutton & Todd.)

T. congolense (Brodin.)

T. confusum (Montgomery & Kinghorn.)

Dr. Edington's trypanosome from Zanzibar (Bruce, Hamerton, and Bateman.)

Trypanosome from Chai-Chai, Zambesi, Zululand (Theiler.)

Trypanosome from Southern Rhodesia (Bevan.)

Now it will be remembered that Montgomery and Kinghorn advanced the suggestion that the parasite named by them *T. confusum* might be carried by blood-sucking flies other than *Glossina morsitans* and a similar suspicion attached to the trypanosome of Chai-Chai.

Again, Bruce considers that the carrier of the *T. pecorum*, found by the Sleeping Sickness Commission in Uganda, was probably a *Tabanus*.

But as far as the trypanosome of cattle in Southern Rhodesia is concerned, additional experience has shown no reason to alter the opinion advanced in the interim report on the Animal Trypanosomiasis of Southern Rhodesia, 1909, that "it would appear that the trypanosomiasis of Southern Rhodesia is strictly related to the distribution of the "tsetse fly," and that if it occurs in an area free from "fly" (*G. morsitans*) it has been brought there from an infested area and fails to spread."

Again, equines appear to be very refractory to the trypanosomiasis of Southern Rhodesia, and only once has a case of natural infection in mules been encountered.

This occurred recently in a span of six mules which had travelled through the Mafungabusi district, passing through a "fly belt" some five miles wide. Two of the mules died on the return journey, and two of the remainder shewed a few trypanosomes in their blood. These latter have recovered, although continually worked.

It is not at all certain that the trypanosome in these animals was the same as that prevailing in the Gatooma, Hartley and Lomagundi districts, where hitherto no infected equine has been met with, although horses, mules and donkeys have been submitted to the same risks as cattle which have contracted the disease.

The Government Entomologist took two donkeys into the Lomagundi "fly belts" and himself saw them bitten by innumerable tsetse flies (*G. morsitans*). These have been under constant observation since and have revealed no evidence of trypanosomiasis.

The *Trypanosoma pecorum* sets up a rapid and fatal disease of cattle in Uganda, whereas the Trypanosomiasis of cattle of this country is not invariably fatal. On the contrary, a very high percentage of infected animals recover, and instances are known of herds which have been

established from a nucleus of "fly struck" cattle, bought cheap, which having been grazed on good veld have recovered.

From the point of morphology the local trypanosome seldom if ever measures less than 12 m., and the absence of short forms made it possible to distinguish preparations of it from smears containing the strain of trypanosomiasis obtained from Broken Hill.

Therefore, in view of the differences in morphology, susceptibility and transmission the trypanosome of Southern Rhodesia should be excluded from the group to which the name *T. pecorum* has been applied.

Trypanosoma rhodesiense.—This trypanosome, which was first studied in this Laboratory and described in the Journal of Comparative Pathology and Therapeutics, Vol. XXIII., Part 2, has attracted considerable attention and is now being investigated by Sir David Bruce, Dr. Alan Kinghorn and other experts on the spot, who are busily engaged in determining the natural transmittor of the parasite.

The observations published in the above article as to the exceptional virulence of the organism, its resistance to arsenicals and the susceptibility of domestic animals have been confirmed by other workers in the Laboratory and in the field.

One laboratory result, obtained early in the year, which suggested that the human trypanosome of Northern Rhodesia might be distinct from the *T. gambiense* of "Sleeping Sickness," was the quite extraordinary oedema of the face of rabbits and sheep artificially inoculated.

The same swelling of the head was not met with in animals inoculated with a strain of trypanosomiasis obtained from a typical case of trypanosomiasis contracted on the Lualaba. Several sheep and a dog inoculated with this latter strain recovered, whereas no case of recovery was ever met with at this Laboratory among animals inoculated with the Rhodesian trypanosome.

Southern Rhodesia Imports.

The following list of imports into Southern Rhodesia for the period six months ending June 30th, 1912, will be found of interest as showing to what extent we are still dependent upon "foreign" produce :—

ARTICLE.	1912		1911	
	S.A.P. value. £	Not S.A.P. value. £	S.A.P. value. £	Not S.A.P. value. £
Butter	9 050	1,199	6,613	1,936
Cheese	367	2,940	272	2,717
Maize	9,761	8,329	1,619	954
Oats	2,510	29	1,537	20
Wheaten Flour & Meal	11,095	13,084	9,516	14,361
Eggs (935,424) ...	5,760	1,004	4,832	849
Meats: fresh, frozen, preserved (including bacon and hams) ...	2,939	15,357	7,055	21,636
Rice	—	11,120	—	7,269
Potatoes	2,261	1,021	74	845
Cigars and Cigarettes	20,092	7,334	17,627	7,019

Review.

"THE STOCK OWNERS GUIDE."

"The Stock Owners' Guide," published by the "Pastoralists' Review," and on sale at Hitch's, Salisbury, is practically a collection of various articles which have appeared from time to time in that paper, and include amongst other articles, notes on Fencing, Gates and Fastenings, Floodgates and automatic collapsible Fences, Water Supply, Sheep and Cattle Dipping, Irrigation, Ensilage, Buildings, etc. To the Australian Farmer, for whom it is primarily intended, it is no doubt a very useful book, but much of the subject matter does not concern the Rhodesian farmer, and in some articles the details, such as choice of material, approximate cost and the like, do not apply to this country, and so are robbed of their local value. In spite of these drawbacks, the book contains many useful "tips." The notes on Fencing, Irrigation and Ensilage, together with the photos in the appendix, of typical specimens of different breeds of sheep and cattle, are perhaps the most useful to Rhodesians.

Market Reports.

SALISBURY.

The market is well supplied with all kinds of produce except beans and monkey nuts, which are practically unobtainable in Rhodesia.

The following are average quotations at various centres :

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Barley, per 150 lbs. ...	9/0 11/0	9/6 11/0	—	27/6 30/0
Beans, per 203 lbs. ...	30/0 32/0	—	—	—
Beans, Sugar ...	—	28/6 32/6	—	—
Beans, kafir, per 203 lbs. ...	—	22/6 25/0	—	30/0 35/0
Boer Meal, unsifted, per 200 lbs. ...	—	22/6 23/6	40/0 41/0	37/6 40/0
Bran, per 100 lbs. ...	6/0 7/0	5/9 6/3	14/0 14/6	15/0 15/6
Flour ...	—	—	25/6 26/6	—
Flour, Colonial 100 lbs. ...	—	14/9 16/0	22/0 22/6	20/0 24/0
Forage, 100 lbs. ...	3/6 5/9	—	10/6 12/0	—
„ Colonial Oat ...	5/3 5/6	5/0 5/6	—	10/0
Hay, per bale ...	6d. 11d.	—	per ton. 60/0 70/0	per ton. 35/0 40/0
Kafir Corn, White, per 200 lbs. ...	13/0 13/9	13/6 15/6	—	—
Manna, per 100 lbs. ...	2/0 3/6	—	—	5/6 6/0
Mealies, S.A., White per 200 lbs. ...	8/6 9/5	10/3 11/0	18/0 19/0	14/6 15/6
Mealies, S.A., Yellow, per 200 lbs. ...	8/5 9/3	10/3 11/0	17/0 18/0	—
Mealie Meal, White, per 200 lbs. ...	—	(183 lbs.) 10/6 11/6	—	—
Manga, per 200 lbs. ...	—	—	—	—
Monkey Nuts, per bag ...	—	—	17/6 18/6	—
Oats, per 150 lbs. ...	6/0 8/4	10/6 11/9	20/0 20/6	21/6 22/0
Onions, per 120 lbs. ...	11/6 13/6	10/0 14/0	25/0 26/0	27/6 30/0
Peas, per 200 lbs. ...	20/0 23/6	—	—	—
Potatoes, per 150 lbs. ...	7/9 15/0	10/0 17/0	28/0 30/0	27/6 30/0
„ New ...	17/0 22/0	10/0 21/6	—	—
Rapoko ...	—	—	—	25/0
Rye, per 200 lbs. ...	12/0 13/0	—	per bag 10/6 11/0	25/0 27/6
Salt, per 200 lbs. ...	—	—	—	14/0 15/0
Tobacco, good, per lb ...	—	—	—	—
„ inferior, per lb ...	—	—	—	—
Wheat, per 203 lbs. ...	12/9 15/0	18/0 20/0	—	30/0
Butter, per lb. ...	11½d. 1/5	1/0 1/5	1/6 1/9	1/6 2/0
Butter, second quality ...	—	—	—	1/0
Eggs, per doz. ...	10½d. 11½d.	1/0 1/3	1/6 2/0	3/0 3/6
Ducks, each ...	2/4 3/2	1/9 2/9	—	3/6 4/6
Fowls, each ...	1/6 3/3	1/0 2/3	1/1 1/10	2/6 4/6
Geese, each ...	3/3 4/6	—	—	7/6 10/0
Turkeys, each ...	5/6 14/0	5/6 10/6	—	11/0 14/0

LIVESTOCK.

Article.	Johannesb'rg	Kimberley.	Bulawayo.	Salisbury.
Horses ...	£25	£10 £25	£25 £40	£20 £35
Mules ...	£23	£18 £25	£35 £40	£20 £32/10
Donkeys, geldings	£6	£5 £7	£8/10 £10/10	£5 £7
" mares	—	£6 £7/10	—	£7 £8/10
Cows, Dairy	£25	St'r £7 £8/10	£25 £35	£20 £32/10
Cows, Native	—	—	—	£10 £11
Oxen, Trained	—	—	100 lbs.	£9/10 £12/10
Oxen, Slaughter	—	—	35/0 40/0	40/0 42/0
Oxen, Ordinary	£8/10	£7/10 £8/10	£8/10 £11/10	—
Oxen, good	—	£10/10 £13/10	—	—
Oxen, medium	—	—	—	—
Calves, Slaughter	£2/10	£2 £3	—	£2 £3
Heifers, Colonial	£6/10	—	£8 £17/10	£9 £15
Heifers, Native	—	—	—	£7/10 £8/10
Sheep, ...	£1	11/0 14/0	22/6 25/0	22/6 24/0
Pigs, clean, per lb.	3d.	2d. 3d.	—	4d.

Veterinary Report, May, 1912.

SALISBURY.

AFRICAN COAST FEVER.—

No fresh outbreak occurred. One beast in the affected herd on the Commonage contracted the disease and was destroyed.

Total mortality to date, 2.

All cattle in the suspected infected section of the Commonage are temperatured daily and dipped every third day.

Bovine Piroplasmosis (Red Water).—1 case occurred.

Equine Piroplasmosis (Biliary Fever).—2 cases occurred.

ANIMALS IMPORTED.—

Horses	...	...	29
Cattle	...	...	286
Sheep	...	...	910

BULAWAYO.

AFRICAN COAST FEVER.—There were no fresh outbreaks during the month.

EXISTING OUTBREAKS.

Bulawayo Commonage.—Five cases occurred bringing the total mortality to 127 head.

Bembesi.—One beast died at the farm Induba. Total mortality to date, 25 head. This case was the result of moving the herd a short distance on the farm for grazing purposes.

North Paddock Mzingwani.—The cattle in this paddock were released and handed back to their owners and most of them moved to the Mzingwani Native Reserve where a dipping tank has been erected.

Collaton and Irene.—A very large increase in the number of cases occurred: 122 head of cattle were destroyed during the month. Total mortality, 185 head.

The position at this centre is most unsatisfactory. There are upwards of 900 head now on the two farms, and all have to come to the infected veld for water. The grazing is getting very bare and the mortality from starvation will be heavy during the next few months.

Many cases of a sub-acute form of the disease have occurred. The animals concerned never showed a rise of temperature; in some cases there was very little external appearance of illness, in others symptoms were well marked. Post mortem lesions were characteristic of Coast Fever. A similar form of the disease was observed during the last Inyanga outbreak.

Wollendale.—All the cattle remain healthy but grazing is getting very short.

MALLEIN TEST.—The following animals were tested on importation and found free from glanders:—

Horses	...	...	119
Mules ...	...	...	75
Donkeys	...	...	100

The horse detained in April was re-tested and found healthy.

IMPORTATIONS.—

Bulls	...	...	20
Heifers ...	...	...	651
Small Stock	...	...	5,443
Ostriches	...	...	48
Pigs	...	...	16

HORSE SICKNESS INOCULATION.—19 Mules inoculated, one of which died.

UMTALI.

AFRICAN COAST FEVER.—No fresh outbreaks, and no cases on the Commonage infected area. Four calves were purchased and placed on the infected area, with a view to locating if possible the exact seat of infection.

MALLEIN TEST.—Eight horses were tested on importation and found healthy.

IMPORTATIONS.—46 slaughter cattle from Macequee.

 GWELO.

IMPORTATIONS.—Five bulls imported from England were tested with Tuberculin: no reaction occurred.

HORSE SICKNESS INOCULATION.—Two mules inoculated without loss.

MAKONI AND INYANGA.

No fresh outbreaks of Coast Fever, and all cattle previously removed from infected veld remain healthy. Three-day sickness is still prevalent.

MELSETTER.

No fresh outbreaks of Coast Fever. It is now over twelve months since the last case occurred.

GWANDA.

The following animals were tested with Mallein on importation and found free from glanders:—

Horses ...	...	...	17
Mules ...	...	...	1
Donkeys	...	...	11

PLUMTREE.

The following animals were tested with Mallein on importation and found free from glanders:—

Horses ...	...	...	1
Mules ...	...	...	34
Donkeys	...	...	20

VICTORIA.

Stiff Sickness (Ephemeral Fever).—Several cases reported.

RABIES.—An outbreak occurred at a farm seven miles east of the township. The existence of the disease was confirmed by laboratory tests.

One European and several natives were bitten all of whom were sent to the Pasteur Institute, Salisbury.

All other districts reported healthy.

J. M. SINCLAIR,
Chief Veterinary Surgeon.

Veterinary Report, June, 1912.

SALISBURY.

AFRICAN COAST FEVER.—No fresh outbreaks and no cases on the infected section of the Commonage.

ANTHRAX.—An outbreak occurred amongst pigs on plots 39, 40 and 41, Ardbennie Township; seven deaths occurred, in two of which characteristic lesions of the disease were manifested.

MALLEIN TEST.—The following animals were tested with Mallein on entry, and found free from glanders:—

Horses	...	...	3
Mules	...	...	13

TUBERCULIN TEST.—The following English cattle were tested with Tuberculin on arrival:—

Estates Department—4 bulls, 12 cows, 28 heifers.

L. Glanfield—4 bulls, 6 heifers.

H. Williams—8 bulls.

Two animals of the Estates Department consignment reacted and were destroyed; two gave suspicious reactions, and will be re-tested at a later date.

All these animals are undergoing inoculation against gall sickness and redwater. The process is not yet complete, but so far the results with the Estates Department cattle are most unsatisfactory, due no doubt to the class of animal imported.

HEPATIC PARASITES IN SHEEP.—Several deaths occurred on the farm Kilmuir. *Post-mortem* showed the presence of *Stilesia Hepatica* in the bile ducts.

BULAWAYO.

AFRICAN COAST FEVER.—There were no fresh outbreaks during the month.

EXISTING OUTBREAKS.

Bulawayo Commonage.—One case occurred, bringing the total mortality to 128 head.

Bembesi (Induba Farm), Inyorka, North Paddock (Mzingwani), Wollendale.—No fresh cases.

Collaton and Irene.—During the month 167 died or were destroyed on rise of temperature, and 72 head were sold to butchers and slaughtered. Total mortality due to Coast Fever 352. Three day dipping was started on 28th June, and it is hoped that the death rate will be thereby diminished.

ANTHRAX.—Two calves succumbed to this disease on the infected farm Umganin.

MALLEIN TEST.—The following animals were tested on entry and found free from Glanders (including Plumtree and Gwanda):—

Horses	...	...	313
Mules	...	...	58
Donkeys	...	...	386

IMPORTATIONS :—

Bulls	...	...	28
Heifers	...	...	404
Sheep and Goats	...	...	6,868
Pigs	...	...	18

UMTALI.

AFRICAN COAST FEVER.—No fresh outbreaks, and no cases on the infected portion of the Commonage.

The four animals placed on the infected area with a view to locating if possible the exact seat of infection remain healthy.

HORSE SICKNESS.—No cases of horse sickness have been reported during the season.

IMPORTATIONS.—Thirty-three head of slaughter cattle from Macequece.

INYANGA AND MAKONI.

The Assistant Veterinary Surgeon, Rusapi, inspected all the herds which at one time or another were infected with Coast Fever, also several herds adjacent to infected veld, and

found all healthy. Except in two cases, all the infected herds have been free from disease for more than twelve months, and there is every prospect of the districts being released from quarantine in a few months.

MELSETTER.

No contagious disease reported during the month. The Assistant Veterinary Surgeon made an extended tour in the southern portion of the district, and reports that generally all stock is in good health, but suffering somewhat from the shortage of keep.

MALLEIN TEST.—Five donkeys, ex-Transvaal, were tested and found healthy.

GWELO.

No contagious disease reported.

The two English bulls at the Central Estates, which reacted suspiciously to tuberculin on arrival in May, were re-tested. Both reacted and were destroyed.

VICTORIA.

No contagious disease reported.

Messrs. Plant and Chambers' imported Longhorn Bull died a few weeks after arrival from an attack of redwater.

LOMAGUNDI.

For illegally introducing sheep and goats from Portuguese East Africa, a European was fined £50.

All other districts reported free from disease.

GENERAL.

HORSE-SICKNESS.—The mortality during the past horse-sickness season is the lowest on record. The greatest number of deaths reported in any district was 12, in Kimberley Reefs.

SHORTAGE OF GRASS AND WATER.—Owing to the short rainfall last season both grass and water are very scarce in various districts, and many stock owners are experiencing great difficulty in obtaining sufficient to carry their animals through.

It has been found necessary on this account to temporarily withdraw the prohibition against the presence of cattle in the twenty mile radius on our southern boundary for grazing purposes, and a large number of cattle have already been moved there under the supervision of an official of the Native Department.

J. M. SINCLAIR,
Chief Veterinary Surgeon.

Agricultural Reports

AUGUST 1ST, 1912.

The early termination of the rains last season had the effect of considerably limiting the area placed under winter crops, and it is in only a few favoured districts where anything in this direction has been attempted this year. For the same reason the veld throughout the territory is deficient this season, but reports indicate that stock is doing surprisingly well considering the nature of the pasturage.

At Umtali the veld is very poor, particularly so in parts, and although stock may be said to be in fair condition, farmers are apprehensive about getting through the next few months without loss. Winter crops where attempted are satisfactory but owing to the very limited rainfall, cultivation is only possible on land served by irrigation canals, which are few in number,

In the Inyanga district the crops reaped in May and June were very poor and a scarcity of food is expected in the high veld. In the low veld the natives have ample food. So far, with a few exceptions, all stock is faring well and in spite of the dry season the pasturage is fairly good. Scab is prevalent among the native small stock, but there is no disease amongst the big stock.

Many farmers in the Rusapi district are growing winter crops, but with most, the cultivation is as yet only in an experimental stage. There are, however, some farmers who have taken up this branch of agriculture seriously and of the number, Mr. C. Walker of Chironga, has about 50 acres of wheat and 20 acres of forage which are looking well on irrigated granite vlei soil. Mr. Delport of Headlands, has eight acres of excellent wheat, while Mr. Richards, of Woodlands, has 20 acres of oat-forage and 10 acres of wheat which promise to turn out well. Considering the time of the year cattle are looking very well.

In the Salisbury and Mazoe districts stock appears to be well provided for. Hay has been cut everywhere and the grazing is not bad considering how little rain there was. The native cattle in the reserves having plenty of room will get through the dry season all right. Unfortunately grass fires have been serious in the new cattle ranching district in the Umvukwes. In other parts of the Mazoe district the grazing has been well preserved.

There are practically no winter crops in the vicinity of Hartley and Gatooma, but at Messrs. Swarder's farm, Hallingbury, forage and wheat are being grown with encouraging results. At Lanteglos, Mr. Woodforde by means of water from a bore hole, has 10 acres under lucerne, barley, vegetables, etc., all of which are doing well. Near the N'gesi River and between there and the Beatrice Mine, farmers are growing wheat and barley, only two of whom have irrigation furrows. The crops are planted in moist lands adjoining small rivers, and though not as high as they were this time last year, are fresh and green. Though the rainfall was light, in no place in the Hartley district did the grass suffer and it has grown to its usual height. Grass fires, though still prevalent, are not so bad as in former years. There is ample grazing in outlying parts. Farmers are everywhere moving their cattle to vacant land where grazing may be obtained; but the situation is not serious, and all stock is in fair condition.

In the Gwelo district the mealie harvest was exceedingly poor owing to the scarcity of rain last season. Stock is looking remarkably well where the slightest attention has been paid to grass and water.

In the Belingwe and Gwanda districts stock of all classes is faring very well.

Drought has been most severely felt by the natives in the Chibi district, and by European farmers between Bulawayo and Plumtree and in the Mopani veld south of the Matopos. All over the country the ravages of veld fires are most noticeable.

Weather Bureau.

TEMPERATURES.

STATION.	MAY.		JUNE.	
	Max.	Min.	Max.	Min.
MASHONALAND—				
Chicongas Location	81·6	51·9	73·1	44·4
Chishawasha	79·4	50·2	71·9	42·1
Giant Mine, Gadzema	84·3	55·1	75·5	45·0
Hallingbury Farm (Hartley)	82·6	51·3	73·8	40·7
Melsetter	72·1	—	63·6	—
Salisbury Agricultural Laboratory	76·5	51·3	69·7	42·0
” Gaol	78·0	50·4	71·2	40·2
Victoria	56·4	51·8	69·6	41·3
MATABELELAND—				
Bulawayo Observatory	78·6	52·7	69·0	42·8
Essexvale	81·6	52·2	72·4	38·6
Empandeni	80·8	51·8	69·9	39·5
Gwelo	78·5	53·1	60·2	40·9
Rhodes Matopo Park	—	—	70·1	38·6
Plumtree	79·0	53·3	—	—
Tuli	84·0	56·0	77·0	40·5
Victoria Falls	88·4	53·0	77·8	40·3

RAINFALL.

STATION.	May.	June.
MASHONALAND—		
Banket Junction	—	—
Charter (The Range)	0·58	0·04
Charter (Meikle's Farm)	0·48	—
Charter (Rhodesdale Estate)	0·94	0·01
Charter (Driefontein)	0·85	0·08
Charter (Grootfontein)	0·47	—
Chilimanzi	0·65	—
Chishawasha	—	0·16
Darwin	—	—
Enkeldoorn	1·27	—
Gatooma (Railway)	0·86	—
”	0·95	0·21
” (Chivy chase)	—	0·12
Gadzema (Giant Mine)	0·07	0·01
Goromonzi	0·06	—

RAINFALL—*continued.*

STATION.				May.	June.
MASHONALAND—(Continued)					
Hartley (Railway) ...	...	...	...	—	—
" (Ardgowan) ...	...	...	...	0'20	—
" (Stoneygate Farm) ...	...	...	...	0'21	—
" (Hallingbury Farm) ...	...	...	...	0'45	—
Inyanga ...	...	...	...	0'39	0'12
" (York Farm) ...	...	...	...	0'97	0'64
Kanyemba ...	...	...	...	—	—
Lomagundi (Lone Cow Estate)	...	...	...	—	—
" (Palm Tree Farm)*	...	...	...	—	0'14
Makoni (Eagle's Nest) ...	...	...	...	0'54	0'14
" (Monte Cassino) ...	...	...	...	0'12	0'02
Makwiro ...	...	...	...	0'37	0'16
Marandellas (Railway) ...	...	...	...	—	—
" (Bonongwe) ...	...	...	...	0'30	0'04
" (Good Hope) ...	...	...	...	0'34	0'06
" (Tweedjan) ...	...	...	...	0'06	0'23
Macheke (Railway Station) ...	...	...	...	—	—
Mazoe (Teign) ...	...	...	...	—	—
Melsetter (Tom's Hope) ...	...	...	...	1'24	0'31
" (Vermont) ...	...	...	...	1'91	1'30
" (Government Offices) ...	...	...	...	1'24	1'01
" (Mount Selinda) ...	...	...	...	2'30	1'28
Mrewa ...	...	...	...	0'08	—
M'toko ...	...	...	...	—	0'01
Norton Siding ...	...	...	...	—	0'06
Odzi (Selim Mine) ...	...	...	...	0'20	0'08
Rusapi (Railway) ...	...	...	...	0'30	1'20
Salisbury ...	...	...	Gaol ...	—	—
			Laboratory ...	—	—
			Public Gardens ...	—	—
			Railway Station ...	—	—
			Darwendale ...	—	—
Shamva ...	...	...	The Meadows ...	—	0'16
				—	0'01
Sinoia ...	...	...	...	—	—
Umvuma (Railway Station) ...	...	...	...	0'75	—
Umtali (Summerfield) ...	...	...	...	0'88	0'41
" (Railway) ...	...	...	...	0'28	0'51
" (Utopia) ...	...	...	...	0'17	—
" (Mutambara Mission) ...	...	...	...	0'02	—
" (Premier Estate) ...	...	...	...	0'02	—
" (Chicongas Location) ...	...	...	...	0'13	0'29
Victoria (Gutu) ...	...	...	...	0'09	0'29
" (Gokomere) ...	...	...	...	0'16	0'07
" (Marthadale) ...	...	...	...	0'20	0'62
" (Morgenster) ...	...	...	...	0'57	0'08
" (Pamushama) ...	...	...	...	—	0'58
Victoria ...	...	...	...	0'19	0'22

RAINFALL—*continued.*

STATION.	May.	June.
MATABELELAND—		
Balla Balla Railway Station	0'52	0'02
Battlefields Railway Station	—	—
Bembezi Railway Station	0'28	—
Bulawayo Observatory	0'59	—
" Railway	1'01	—
" Fort Rixon	0'51	—
" Mtshabizi Mission	0'45	0'04
" Matopo Mission	—	0'03
Empandeni	0'64	—
Essexvale	0'73	0'02
Fig Tree	0'43	0'05
Globe and Phoenix	0'57	0'02
Gwaai Railway Station	0'75	—
Gwanda Railway Station	—	—
Gwelo Railway Station	0'25	—
" Gaol	0'32	0'05
" Lower	0'42	—
" Lalapanzi	0'10	0'05
" Shawlands	0'65	0'03
Heaney Junction, Railway	0'88	0'03
Insiza Railway Station	—	—
" Dawn Farm	—	0'02
Imbeza Kraal	0'41	—
Infiningwe	—	0'05
Lochard Siding	—	0'10
Mangwe Garth	0'38	—
Malindi	—	—
Nyamandhlovu Railway	0'14	—
" Mpondeni	0'14	0'06
Rhodes' Matopo Park	—	—
Sebungwe	0'04	0'09
Selukwe Railway Station	0'55	0'19
Solusi	0'17	0'06
Syringa	—	—
Victoria Falls, Railway	0'33	0'27
" "	0'50	0'28
Wankie Railway	0'03	—
" Hospital	—	—
West Nicholson, Railway	0'50	—
" Mazunga	0'02	—
‡Plumtree	0'72	0'03

Dates of Meetings of Farmers' Associations, Southern Rhodesia. (SUBJECT TO ALTERATION).

Name of Association.	Place of Meeting.	Secretary.	1912.						
			June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Charter M'gezi	Beatrice Mine & M'gezi River alternately.	W. Krienke	..	..	..	25	..	27	..
*Central	Umvuma & Enkeld'rn	R. Aldons	31	28	26	30	28	30	28
Chipinga	Chipinga	L. Dobell	13	10	8	12	10	12	10
Enterprise	Arcturus	Jas. Watson	10	..	..	..	..	..	..
Figtree Branch, R.L. & F.A.	Figtree Siding	A. Curtis	10	14	12	9	14	14	14
Gatooma	Gatooma	Lionel Gobell	10	7	3	..	..	..	..
Gazaland	Lower Melsetter	H. F. Savory	10	7	5	9	7	9	7
Hartley	Hartley	H. Barnes Pope	..	..	..	..	..	..	..
Headlands	Headlands	W. B. Harris	..	..	..	..	..	..	..
Insiza	Insiza Station and Peggy Store.	G. P. Watermeyer	..	..	..	..	..	..	..
Kimberley Reefs	Kimberley Reefs	B. Smit	11	8	13	10	8	10	8
Lalapanzi	Lalapanzi	I. G. Roberts	17	21	19	16	21	16	21
Lomagundi	Sinoia	A. B. Fraser	..	..	..	..	..	..	..
Macheke	Macheke	H. H. Kidson	..	..	..	..	..	..	..
Makwiro	Makwiro	P. B. Snashall	17	21	19	16	21	16	21
Manica	Xmas Pas Hotel	C. M. Wright	3	2	7	4	2	4	2
Marandellas	Marandellas & Settlement Farm.	MacW. Ingram	3	17	5	2	7	2	7
Marula	Marula Siding	W. H. Williamson	17	21	19	16	21	16	21
Mashonaland	Salisbury	W. E. Dowsett	9	13	11	8	13	11	8
Matopo Branch, R.L. & F.A.	Matopos Terminus Hotel.	M. W. Ingram	..	..	..	..	..	..	1
Mamba Branch, R.L. & F.A.	Mamba Siding	G. Noaks	17	21	19	16	21	16	21
Mazoe	Mazoe	N. N. Rutherford	..	..	..	..	..	..	..
Melsetter (North)	Various Farm Houses	M. L. Price	..	..	..	..	..	..	..
Midlands	Gwelo	A. Tulloch	10	14	12	9	14	12	9
Northern	Farm "Jerain"	Chas. Atkinson	1	5	3	7	5	3	7
Umtali	Plumtree	S. Annandale	9	..	11	..	13	11	13
Rhod. Landowners & Farmers	Bulawayo	N. N. Rutherford	30	27	25	20	27	25	20
Somabula and Shangani Flats	Farm "Fairview"	J. Rutherford	3	7	5	2	7	5	2
Umvumvuma	T-Membarra Mission	..	..	..	..	..	..	..	..
Victoria	Victoria	..	21	18	16	20	18	20	18

* Head Quarters at Umvuma. One Meeting in each quarter held at Enkeldoorn.

Departmental Notices.

LECTURES FOR FARMERS.

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable, lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner but the suggestion of other themes is invited.

Agriculture.—Maize growing ; Maize selection and maintenance of the breeding plot ; Points of maize and maize judging, with demonstrations ; Utilisation of granite vlei soils ; Ground nut culture ; Rotation crops for home use and for sale ; Veld improvement by winter grasses ; Production of foodstuffs for the mines ; Ensilage ; Fungoid diseases of maize and wheat ; Wheat, oats, and lucerne under irrigation ; The prospects of cotton culture in Southern Rhodesia.

Veterinary Hygiene.—Detection and prevention of disease
The care of livestock.

Livestock.—Judging of cattle according to breeds, and for beef, milk, and draught ; feeding and kraaling of live stock ; general principles of cattle breeding ; management of imported stock ; grading up of native or local stock with pure bred bulls.

Dairying.—Home butter making ; building and equipment of a farm dairy ; handling and marketing of milk ; packing and marketing of butter ; construction of cow houses.

Swine Husbandry.—Breeding and feeding of swine ; some suggestions for the production of first class bacon pigs ; construction of piggeries at moderate cost.

Chemistry.—The principles of soil fertility; the principles of manuring; the value of lime in agriculture; chemistry of milk and its products (accompanied by demonstrations in milk testing).

Entomology.—Economic entomology on the farm; the role of insects and their allies in the transmission of disease; scale insects and fruit trees and methods for their control; insect pests and maize; enemies of the potato, insect and fungus; the value and objects of plant import and nursery regulations.

Irrigation.—Methods of applying water to land for irrigation; the measurement of water in connection with irrigation; canal irrigation; storage reservoirs; hints on the selection of sites and on the design of earthen and other dams; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

SALE OF SEED MAIZE.

It is anticipated that selected seed maize of the under-mentioned varieties, grown on the Government Experiment Farm, Gwebi, will be available for sale during the months of August and September:—

Hickory King ...	...	8 row.
Hickory King ...	...	10 row.
Salisbury White	...	12 row.

This seed is the outcome of three years' careful selection, and is offered for sale in order that farmers may be able to establish breeding plots on a reasonably large scale with seed which may be expected to breed true to type.

Owing to an unfavourable season supplies of seeds are limited, and early application should be made. The amount of seed available will be, as far as possible, distributed equally amongst all applicants.

The price is 15s. per 100lbs., free on rail, Salisbury, and applications should be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury.

CO-OPERATIVE EXPERIMENTS.

DISTRIBUTION OF SEED.

The Department of Agriculture expects to have in stock the following seeds for distribution this season under the usual terms of Co-operative Experiments. Farmers anxious to test crops which have proved successful on the Experiment Stations, on a small scale before sowing more largely, are invited to send in their applications as soon as possible. The distribution is limited, and not more than three to five sorts can be sent to each applicant. The amount sent to any one farmer will depend on the number of applications received, but in any case, sufficient seed will be forthcoming to give the crops a fair trial.

Seed is issued f.o.r. Salisbury, and farmers are required to pay railway carriage. When the Agricultural Parcels Post Regulations are applicable this means of forwarding will be used as being cheaper and more rapid. Under these terms the seed is issued, on condition that the farmer co-operating *supplies at the end of the season a true report on the result of the experiments on forms supplied for that purpose.*

Applications should be addressed to the Government Agriculturist and Botanist and as far as possible, will be dealt with in the order received.

Summer Wheat and Oats.—Victoria Wheat, Sidonian Oats (early), New Zealand Oats (mid season), Algerian Oats (late).

Other Summer Cereals.—Boer Manna, Japanese Millet, Dryland Rice, Swamp Rice, Teff Grass.

Leguminous Crops.—Egyptian Clover, Velvet Beans, Cow-peas, Florida Beggar Weed, Vetches, Lucerne, Ground-nuts—Virginian and Spanish.

Root Crops.—Mangels, Carrots, Sugar Beet, Kohl Rabi, Chicory.

Pasture Plants.—Paspalum, Toowomba Canary Grass, Burnet, Tall Fescue, Cocksfoot, Brome Grass, Cowgrass Clover

Miscellaneous Crops.—Linseed, varieties Castor Oil, varieties Cattle Melon, Sunflower, Rape, Thousand Head Kale.

SALE OF DIP THROUGH THE VETERINARY DEPARTMENT.

Messrs. W. Cooper and Nephews have lately placed on the market a cattle dipping fluid adapted for frequent use on the principle now coming into vogue, for three day or five day dipping. This preparation possesses many advantages, and has been tested by the Veterinary Department with satisfactory results.

With a view to enabling farmers to obtain dipping material at as low a price as possible, arrangements will be made whereby orders may be placed with any officer of the Veterinary Department. The price has been fixed at the specially low figure of five shillings per gallon, delivered at any station or siding desired, for quantities of not less than ten gallons. Applications must be accompanied by remittances, without which they cannot receive attention. Coin or stamps will not be accepted.

This dip will be used at all public dipping tanks.

IMPORTATION OF PURE BRED PIGS FROM ENGLAND.

The Department of Agriculture is prepared to import, on behalf of farmers, pure bred pigs from England, of the following breeds:—Berkshire, Large Black Sussex, and Large or Middle White Yorkshires.

The probable total cost of such animals delivered to the farmer in Rhodesia, will be :—Boars, £25; Sows, £18.

TERMS.—Applications should be addressed to the Chief of the Animals Industries Branch, Department of Agriculture, Salisbury, and must be accompanied by a deposit of £1 per head which may be forfeited in case of withdrawal or refunded if no animal is supplied, and which will be deducted from the ultimate cost delivered.

Applicants should clearly state the breed, sex and age of the animal they require, and must agree not to dispose of any animal, until payment is completed, without the written consent of the Director of Agriculture. Applicants must agree to accept the animal allotted to them. The price is payable in instalments of one-third on delivery, one-third

after six months, and the balance one year after delivery, and continues to be payable in the event of the death of the animal before the date on which payment is due.

Insurance may, if desired, be effected for this period at the cost of the purchaser. The right of refusal of any application without stating the reason is reserved.

Note.—Owing to the outbreak of foot and mouth disease in England, and the consequent closing of the ports, the above arrangements are suspended *sine die*.

TOBACCO SEED.

The Department of Agriculture is distributing a few varieties of cigar seed to farmers who have likely soil, and who wish to experiment with this type of tobacco. The varieties are Sumatra, Cuban seed leaf and Zimmer Spanish, and application for the seed should be made to the Tobacco Expert, Department of Agriculture, Salisbury. It is notified for general information that the Department of Agriculture does not supply tobacco seed to growers except for experimental trials in small quantity. Tobacco seed is sold at a moderate charge by the Tobacco Company of Rhodesia and South Africa, Ltd., and application should be made direct to the manager of the Tobacco Warehouse, Salisbury.

PURCHASE OF PIGS IN SOUTH AFRICA.

The purchase of pure bred pigs within South Africa is also undertaken on behalf of farmers. Particulars may be had on application to the Animal Industries Branch, Department of Agriculture, Salisbury.

EMPLOYMENT ON FARMS.

The Department of Agriculture receives numerous enquiries from persons of varied attainments, age and financial position for openings on farms, as managers, assistants and learners, requiring remuneration on corresponding scales, or willing to give services in return for keep. Farmers and others desirous of obtaining assistance of this description are requested to communicate with the Director of Agriculture, Salisbury, in order that they may be put in touch with the applicants for such openings.

PURCHASE OF STOCK IN THE CAPE AND FREE
STATE PROVINCES OF THE SOUTH AFRICAN
UNION, ON BEHALF OF FARMERS RESIDENT
IN SOUTHERN RHODESIA.

The following amended arrangements are published for general information :—

The Government undertakes the purchase of pure-bred livestock for farmers on the conditions outlined below, and on the following terms of payment, viz. :—(1) a deposit on application ; (2) one-third total cost on delivery, less amount of deposit ; (3) one-third after six months, and (4) one-third after twelve months—both these instalments bearing interest at 6 per cent. or 10 per cent. if not paid at due date. These terms of credit will only be allowed on purchases up to a total maximum value of £200 ; sums exceeding that amount are payable in cash along with the first instalment. The Government reserves the right to refuse, without reason given, applications, or to fulfil purchases even after deposit has been made. Applications must be on the prescribed Form "A," and all conditions complied with before same is registered. Applications will be considered in rotation, but fulfilled as opportunity serves, so that animals may be procured as cheaply as possible. The buyer must undertake to accept the animal allotted to him, unless it fails to satisfy *description as given in the application form*. Disputes may be submitted to arbitration. The purchase price will include all expenses up to time of delivery, price paid to original owner, commission and charges of buyer and freight, including, where necessary, attendance and keep on journey. With every application a deposit must be forwarded ; £1 per head in the case of cattle, horses and donkeys, and 5s. per head for sheep, goats and pigs. Such deposit will be deducted from the amount of the first instalment due, but may be forfeited in the event of the application being withdrawn after having been registered. Stock is not to be disposed of without the written consent of the Director of Agriculture until payment is completed.

Purchases will be made by the Department of Agriculture through its authorised representatives. Every effort will be made to secure animals in accordance with particulars

furnished by applicants, and to the best advantage. All purchases must conform strictly to the importation regulations as regards age and freedom from contact with contagious disease. Pedigrees, if obtainable, will be supplied. The Government will bear all risks of transport and of death from any cause until delivery, all losses being chargeable to the vote. All animals failing to pass the necessary test on arrival shall be destroyed and the loss borne by the Government, and another animal purchased for the applicant.

Prospective buyers will be advised of the probable cost. The Department does not undertake to purchase stock at precisely the prices specified by applicants, but will endeavour to approximate as nearly as possible to the figures given and not to exceed same by over 20 per cent. The authorised representatives of the Department will be allowed a reasonable commission, with expenses additional.

The first instalment will become due and payable on delivery. Applicants or their agents will be advised regarding arrival of their stock, after which all responsibility on the part of the Department will cease.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, soils, crops, processes and kindred matters, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without

any indication of where they are from, or why they were sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particular regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

DESTRUCTION OF WILD CARNIVORA, ETC.

It is hereby notified for public information that rewards for the destruction of wild carnivora, etc., will be paid on the scale and conditions herein set forth.

2. Rewards will be paid as follows :—

For each lion	£5	0	0
For each leopard	1	0	0
For each cheetah	1	0	0
For each hyæna	0	10	0
For each wild dog	0	10	0
For each baboon	0	2	6
For each crocodile not less than 3 feet in length	0	10	0
For each crocodile over 1 and less than 3 feet in length ...	0	2	0
For each crocodile under 1 foot in length... ..	0	0	6
For each crocodile egg	0	0	6

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, of the district, within three months of the date upon which the animal is killed, on a solemn declaration on the prescribed form hereunto annexed.

4. In proof of destruction, applicants for rewards will be required to produce and surrender in the case of a leopard or cheetah the skin with the tail unsevered, and in the case of a hyæna, crocodile, wild dog or baboon the unskinned head. In the case of a lion to produce the skin and skull, the skull only to be surrendered.

5. The skins and heads surrendered for rewards shall become the property of the Government and shall be disposed of in such manner as may be decided on.

FORM OF DECLARATION.

I.....do solemnly and sincerely declare that I did on the.....day of, and not before, shoot, trap, or poison (as the case may be)..... (describe the vermin for which the reward is claimed) in the district of.....within the boundaries of Southern Rhodesia, and that I am entitled to the reward offered by the Government.

And I make this solemn declaration conscientiously believing the same to be true.

.....
Signature.

Signed and declared at.....
this..... day of.....

Before me,

.....
Magistrate or Justice of the Peace.

CHEMICAL ANALYSIS OF AGRICULTURAL PRODUCTS.

Arrangements have been made for the chemical examination of soils, limestones; grain, and other produce; oil-seeds, cream, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

SERVICES OF AGRICULTURAL ENGINEER.

It is hereby notified for public information that the services of Mr. W. M. Watt, Agricultural Engineer, are available to the public for the following purposes. Assistance may be obtained by farmers:—

- I. In the locating of possible irrigation projects.

2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

DIPPING TANKS.—GRANTS IN AID.

The Government is prepared to assist farmers in the construction of private dipping tanks by a grant in aid on the £ for £ principle, but not to exceed, however, a total sum of £50.

This grant will only be paid to approved applicants, and after the tank has been inspected by an official appointed for this purpose and found suitable, and on production of receipted accounts in support of their claim.

Applications cannot be considered for grants in aid of tanks already constructed, and those wishing to avail themselves of this assistance should apply beforehand to the Director of Agriculture, from whom full particulars, together with plans and specifications, can be obtained.

SERVICES OF TOBACCO EXPERT.

Farmers wishing to avail themselves of the services of the above should apply to the Director of Agriculture, giving particulars of the nature of advice required, also the distance and direction of their farms from some well-known centre.

DEPARTMENTAL BULLETINS.

The following Bulletins, consisting of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia :—

AGRICULTURE.

- No. 2 The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., L.L.B.
- „ 81 Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S.
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- „ 59 Plans and Specifications of Flue Curing Barns.
- „ 71 Report of Forestry in Southern Rhodesia, by J. Sims, F.H.A.S.
- „ 78 Hints on Irrigation—Small Gravitation Schemes—Pipes and Pipe Laying—by W. Martin Watt, Government Agricultural Engineer.
- „ 68 Fertility of Soils and Organic Matter, by G. N. Blackshaw, B.Sc., F.C.S., Government Agricultural Chemist.
- „ 64 Hints on Irrigation—Small Earthen Reservoir—by W. M. Watt.
- „ 79 Winter Cereals, by H. Godfrey Mundy, F.L.S.
- „ 99 Bean Crops, by H. Godfrey Mundy, F.L.S.

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- No. 55 How Maize can be made more profitable, by H. Godfrey Mundy, F.L.S.
- „ 112 Notes on Winter Cereals without Irrigation, by H. Godfrey Mundy, F.L.S., Government Agriculturist and Botanist.
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- „ 76 Suggestions for Cotton Growers, by R. H. B. Dickson.
- „ 67 Maize Breeding and Seed Selection, by H. G. Mundy, F.L.S., Government Agriculturist and Botanist.
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- „ 93 Soy Beans, by R. H. B. Dickson.
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- „ 51 Strangles, by F. D. Ferguson, M.R.C.V.S.
- „ 113 Anaplasmoses of Cattle, by L. E. W. Bevan, M.R.C.V.S.
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Government Notices.

ANIMALS DISEASES AMENDING ORDINANCE, 1911.

Ordinance No. 2, 1911.]

[Promulgated 17th March, 1911.]

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. So much of the "Animals Diseases Consolidated Ordinance, 1904" (hereinafter referred to as the said Ordinance) and of any other law as may be repugnant to or inconsistent with the provisions of this Ordinance is hereby repealed.

2. The Administrator may, on the outbreak of a destructive disease, or when there is suspicion of the existence of such disease, declare an area around and including the place where such disease exists, or is supposed to exist, actively infected for the purpose of this Ordinance.

3. Whenever an area shall have been declared infected in terms of the last preceding section, the Administrator may, for the purpose of suppressing or controlling disease, cause such fences to be erected along the boundaries of or across any farms or land situated in such area as he may deem necessary.

4. (1) If the landowner shall not pay the cost of erecting any fence as aforesaid upon completion thereof, the cost shall be defrayed in the first instance out of moneys provided by the Legislative Council.

(2) When any fence erected as aforesaid runs along the boundary of a farm, the cost of the erection of such fence shall, if not sooner repaid, be repaid, together with interest at the rate of £5 per centum per annum, by equal yearly instalments commencing two years after the fencing is completed, such instalments being so calculated and fixed that the said cost and interest shall be wholly repaid within a period of fifteen years from the date when the first instalment became due.

(3) Such repayment shall be made by the adjoining landowners whose land has been divided by the fence. Each such landowner shall pay one-half the cost of the dividing fence and interest as aforesaid. When the adjoining land is a native reserve, or a portion of such reserve, the one-half of the cost shall be paid from funds in the local Treasury of the British South Africa Company.

(4) When any fence as aforesaid shall be erected within, and not on and along, the boundaries of any farm, the cost shall be paid from the funds of the local Treasury of the British South Africa Company, and the fence, when no longer necessary for the purpose for which it was erected, may be removed by the British South Africa Company; provided that the landowner shall have the right to purchase such internal fence at a price representing the total cost of such fence.

(5) The term "owner" shall mean (a) the person registered as such in the office of the Registrar of Deeds, (b) the British South Africa Company in respect of native reserves, and (c) the local authority in respect of municipalities.

5. Where the bed of a stream or river lies immediately between or constitutes the boundaries of land owned by private owners, the fence may be erected on one or other bank of the river or stream and across it, or partly on one bank, across it, and partly on the other bank, in such manner as may be agreed upon by the owners whose lands are separated by the said stream or rivers. The Administrator may call upon the said owners to agree to the position of the said fence on or before a date fixed by him, and, should they fail to do so, he may cause such fence to be erected without further reference to the said owners. For the purposes of repayment, such fence shall be considered as dividing the lands of adjoining owners, and half the cost shall be recoverable from each owner whose lands are separated by the said stream or river.

6. The Administrator may call upon any owner whose land has been fenced in terms of section 3 or 12 to provide sufficient security for the payment of any sums that may be due to the British South Africa Company in its local Treasury in respect of such fence. If the owner shall fail or refuse to provide such security, the Administrator may cause a notice in writing to be sent to the Registrar of Deeds of the amount due by such owner, and the Registrar shall make an entry thereof in respect of the land fenced. Such entry shall constitute an hypothecation of the land, ranking from the date on which the entry was made and for the amount therein stated; provided that the Registrar may pass transfer of land so hypothecated if the transferee agrees in writing that any sums due and unpaid shall remain and be registered as a charge against the said land.

7. When any land held under lease or permit of occupation has been fenced in terms of this Ordinance, during the term of such lease or permit the lessee or permit holder shall pay to the proprietor of such land yearly, during the continuance of the lease or permit of occupation, interest at the rate of £5 per centum upon so much of the cost of the fence as the proprietor is liable for, and such payment shall be made with the rent of the land, and shall be deemed in law to be part of such rent.

8. Any tenant or holder of land under a permit of occupation having a right to purchase such land at a fixed price shall, on completion of the purchase, pay to the proprietor, in augmentation and as part of the purchase money, any sum paid by such proprietor for the fencing of such land, and shall become and be liable to repay to the British South Africa Company in its local Treasury such sums as remain unpaid, as the same become due and payable in terms of this Ordinance.

9. Where in the case of any local authority the title to land provides that upon the sale thereof the British South Africa Company shall be entitled to receive a proportion of the purchase price, the local authority shall be entitled to deduct from the purchase price of land sold any debt due or amount paid by it in respect of fences on the land so sold erected under this Ordinance.

10. The provisions of sections 14 and 15 of the "Fencing Ordinance, 1904," in regard to repairs shall, *mutatis mutandis*, apply to fences erected in terms of this Ordinance.

11. Where a fence crosses any road used as of right by the public or by any neighbouring landowner, a properly constructed swing gate shall be placed at the point of crossing.

12. Any person opening such gate, except for the purpose of passing through, or omitting to close such gate after having passed through, and any person damaging such gate and omitting to immediately repair such damage shall be liable to a fine not exceeding £10, or in default of payment to imprisonment with or without hard labour for a period not exceeding one month.

13. The Administrator may, for the purpose of the more effective prevention or control of disease, apply the provisions of this Ordinance in respect of fencing to municipalities and townships and such land adjoining as may be deemed expedient, and to places within a radius of ten miles of an area declared actively infected in terms of section 2 hereof, if, owing to the number of cattle in such places, or other causes, it appears expedient.

14. (1) The owner or proprietor of the land along the boundaries of which fences have already been erected by the British South Africa Company for the purpose of preventing the spread of African Coast Fever in cattle shall be and is liable to repay to the British South Africa Company in its local Treasury one-half of the cost of so much of the fence as may be along the boundary of such land. The provisions of sections 7 and 8 of this Ordinance shall apply in the case of land held under lease or permit of occupation along the boundaries of which fences have already been erected. The British South Africa Company may remove any such fence already erected which is within and not on or along the boundaries of any land when no longer necessary for the purposes for which it was erected.

(2) Any payment due in respect of any such fence may be made as provided by section 4 of this Ordinance, and under the like conditions as to security for such payment as are prescribed under section 6.

15. Within any area declared by the Administrator to be actively infected under the provisions of section 2, or to which the provisions of this Ordinance shall have been applied in terms of section 12, the Administrator may, for the purpose of more effectively preventing the spread of disease cause to be constructed on any land a dipping tank and any structures incidental thereto or other appliances for the dipping of stock, and may recover the expenditure incurred from the owner of the land on which such tank, structures or appliances have been constructed. The cost of such tank, structures or appliances shall be paid on the same terms and under the same conditions as are applicable to boundary fences under sections 4, 6, 7 and 8 of this Ordinance.

16. In addition to any penalties that may be imposed under the said Ordinance or any amendment thereof, or under any regulations framed thereunder for the unlawful movement of cattle, the Court of the Magistrate before which the case is tried or the High Court in the like instance may direct the confiscation of any cattle unlawfully removed, and such cattle, if infected with disease or likely to convey infection, shall be destroyed without compensation. Should there be no danger of infection the Administrator may order such cattle to be temporarily kept at any spot denoted by him and then sold. The proceeds of any such sale shall be paid to the British South Africa Company in its local Treasury.

17. Section II, sub-section (1) of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Should any Inspector, Sub-Inspector or any person specially authorised by the Administrator to carry out the provisions of this Ordinance know or suspect that any animal is infected with any destructive disease such Inspector, Sub-Inspector or other authorised person may forthwith place such animal in quarantine, together with such land as is necessary, for its isolation, and such animals as have been or are suspected of having been in contact with such animal or with infection. Notice of such quarantine shall be given in writing to the owner or custodian of such animal and to the Magistrate of the district, and shall remain in force for such time as the Chief Inspector or Controller of Stock may direct, unless the Administrator shall sooner, if he thinks fit, issue the notice referred to in sub-section (2) of section 5. A copy of the notice of any such quarantine shall be posted at the office of the Magistrate, and shall be inserted by the Magistrate in some newspaper, if any, circulating in the district.”

18. Section 16 of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Any Government Veterinary Surgeon or any person thereto authorised by the Controller of Stock, Chief Inspector or by a Magistrate may enter any land, building, kraal or enclosure for the purpose of inspecting animals. Should any animal be found to be infected with any destructive disease, or should such infection be reasonably suspected, he may quarantine such animals as in this Ordinance provided, and may order the proper disinfection of any building, kraal or enclosure in which such animal is or may recently have been, and the furniture and fittings thereof. Should it be impossible to properly disinfect such stable, kraal or enclosure, furniture or fittings in any of them, he may order the destruction thereof; provided that no building, kraal or enclosure shall be destroyed unless the owner consents thereto in writing, or failing such consent, the Administrator orders that such destruction be carried out.”

19. Section 22, sub-section (1) of the said Ordinance is hereby amended by the addition of the following words after the word “obtained” in the twelfth line of the said sub-section, “and any person receiving or taking delivery of any animals without having ascertained that such permit has been obtained.”

20. This Ordinance may be cited as the “Animal Diseases Amending Ordinance, 1911,” and shall be read as one with the “Animals Diseases Consolidation Ordinance, 1904,” and the “Animals Diseases Amendment Ordinance, 1910.”

No 188 of 1912]

[6th June, 1912

ANIMALS DISEASES CONSOLIDATION ORDINANCE, 1904

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend Government Notice No. 295 of 1908 by the omission of the words "other than glanders, epizootic lymphangitis or African Coast Fever" where they occur in section 3 and in the first paragraph of Schedule "A" thereof

No. 189 of 1912]

[6th June, 1912

ANIMALS DISEASES CONSOLIDATION ORDINANCE, 1904

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare that, notwithstanding the provisions of section 12 of Government Notice No. 50 of 1912, the removal of cattle for purpose of obtaining food or water may be permitted at the discretion of the Chief Inspector, and under such conditions as he may prescribe.

No. 216 of 1912]

[4th July, 1912

REMOVAL OF CATTLE TO PRESCRIBED AREAS

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare that, notwithstanding the provisions of Government Notices Nos. 47 and 254 of 1910 and 51 of 1911 the removal of cattle to any point within twenty miles of the border of the territory defined by the Crocodile, Shashi and Ramaquabane rivers, to the south-east beacon of Mphoeng's extension on the last named, may be allowed until further notice under permit from the Chief Inspector for the purposes of grazing and watering.

DESTRUCTION OF HIPPOPOTAMI.

No. 104 of 1912.]

[28th March, 1912.

UNDER and by virtue of the powers vested in me by sub-section (7), section 4, of the "Game Law Consolidation Ordinance, 1906," I do hereby authorise the destruction of hippopotami, in or near the Zambesi River within ten miles of and above the Victoria Falls, by members of the British South Africa Police or by other persons acting with the written permission of and under the direct control of the Police.

No. 50 of 1912.]

[8th February, 1912.

AFRICAN COAST FEVER.

Regulations regarding the movement of cattle and the prevention and suppression of disease.

I. **U**NDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 329 of 1910 and 308 of 1911 and make the following provisions in lieu thereof:—

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

General Movement.

3. For the purpose of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission:—

- (a) Single farm.
- (b) Two or more adjoining farms, farmed together under one management and situated within one cattle transport area.
- (c) An area, the property of one owner, enclosed by a substantial fence.
- (d) For grazing purposes, an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land.

The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease, or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission, in writing, of an Inspector, Sub-Inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall permit the movement of cattle

- (a) Without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the district over which land or reserve such cattle will pass, whether along roads or otherwise; provided, however, that refusal to grant such consent shall be in writing, and provided further that if the Controller of Stock or the Chief Inspector shall consider that such consent is withheld without good and sufficient cause he may permit of movement without such consent.

If any such person mentioned above refuse to give consent or to state a reason for refusing to do so in writing, no valid objection shall be deemed to exist and movement may be permitted without such written consent.

- (b) Within a veterinary district as defined in the schedule annexed hereto from one transport area to or through another without the consent of the Cattle Inspector in charge of such area.
- (c) From any veterinary district to or through another without the consent of the District Veterinary Surgeon of such district.

Slaughter Cattle.

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same except for the purpose of being slaughtered at the appointed abattoir, and if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock; provided, however, that the Chief Inspector may allow the removal of cattle from such an area under such conditions as he may prescribe.

Transport Cattle.

9. The use of cattle for draught purposes is prohibited except:—

- (1) Within the boundaries of the places defined in section 3, (a), (b) and (c) hereof.
- (2) Within the boundaries of areas already fixed for the use of cattle for draught purposes in terms of regulations published under Government Notice No. 329 of of 1910, or such other areas as may be fixed by the Administrator.

10. Notwithstanding the provisions of section 9, no permit shall authorise the working of cattle

- (a) which are not clearly and distinctly branded with the registered brand of the owner ;
- (b) in any wagon or vehicle which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof

11. No wagon or other vehicle drawn by oxen shall be moved from one cattle transport area into another without the permission of the Cattle Inspectors concerned, and under such conditions as they may impose.

General Provisions.

12. On the outbreak or suspected outbreak of disease, the Administrator may declare an area of infection around and embracing the place of outbreak or suspected outbreak, and a further area or areas around such area of infection as a guard area, whereupon all movement of cattle into and from place to place within such area or areas shall be immediately suspended, except as is hereinafter provided.

A.—In areas of infection and guard areas :—

- (1) Cattle in transit by rail may be moved through such area.
- (2) Cattle from beyond the borders of Southern Rhodesia may be detained within such area or areas *en route* to destination.
- (3) Cattle for *bona fide* farming, dairy and slaughter purposes may be moved into such area or areas by permission of the Chief Inspector and under such conditions as he may impose.

B.—In guard areas only :—

Cattle may be moved into and from place to place within such area under the conditions of section 6 hereof.

13. The removal of green forage, hay, fodder, bedding reeds, manure or of such other articles as may reasonably be supposed capable of conveying infection, shall be prohibited from areas of infection, save and except with the special permission of the Administrator.

14. Whenever an area shall have been declared under section 12 hereof, every person within such area, or within such further area as may be specified by Government Notice, owning or in charge of cattle shall, upon the death or slaughter because of disease, suspected disease, or accident, of any such cattle, immediately report such occurrence through the nearest Cattle Inspector, Native Commissioner or Police Officer to the District Veterinary Surgeon.

15. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

16. Whenever an area shall have been declared an area of infection or guard area in terms of section 12 hereof, any person who shall allow any cattle to stray or be otherwise removed, except as provided for in these regulations, from any one place within such area to another place, or from a place outside of to a place within such area, shall be guilty of an offence against these regulations.

17. All cattle within the limits of the various commonages and townlands, areas of infection and guard areas as declared under section 12 hereof, or depastured on common grazing ground, shall be dipped or sprayed at least once in every three days, unless the Chief Inspector shall authorise the extension of the time between such dipping or spraying, or the entire suspension of the same.

18. In all areas of infection and guard areas sheep and goats shall be dipped at such periods as may be directed by the Chief Inspector.

19. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Chief Inspector may order any natives or other persons

having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

20. All permits for the removal of cattle issued under the provisions of the said Ordinance or of any regulations framed thereunder shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

21. No permit issued for the movement of cattle shall be taken to authorise any trespass in connection with such movement.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks or unless they have been effectively cleansed by dipping, spraying or other process, within fourteen days of being allowed on such road or other place. Any beast having ten or more ticks on it shall not be considered free from ticks.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months,

SCHEDULE "A."

VETERINARY DISTRICTS OF SOUTHERN RHODESIA.

(1) *Salisbury.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

32. Battlefields; 33. Hartly and Gatooma; 34. Gadzema Station; 35. Makwiro Station; 36. Norton Siding; 37. Hunyani Tank; 38. 164½ Peg B. & M. & R. Railways; 39. Salisbury A.; 40. Salisbury B.; 41. Salisbury C.; 42. Salisbury D.; 43. Arcturus; 44. Bromley; 45. Marandellas North; 46. Marandellas South; 48. Headlands Station; 49. Junction, Mazoe and Lomagundi Railways; 50. 23-Mile Peg, Lomagundi Railway; 51. Passaford Station; 52. 35-Mile Peg, Lomagundi Railway; 53. Gwibi Tank Halt; 54. Banket, Lomagundi; 55. Eldorado, Lomagundi; 56. Selby Siding; 57. Mazoe; and 58. Kimberley Reefs.

(2) *Bulawayo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

1. Plumtree; 2. Marula Siding; 3. Figtree; 4. Westacre Junction; 5. Bulawayo Area; 6. Heaney Junction; 7. Bembesi Station; 8. Insiza North; 9. Insiza South; 10. Shangani North; 11. Shangani South; 14. Redbank; 15. Nyamandhlovu Station; 16. Malindi Station; 17. Wankies Area; 18. Matetsi Siding; 19. Matopo Terminus; 20. Sabiwa Siding; 21. Gwanda Station; 22. West Nicholson; 23. Belingwe; 59. Essexvale and Balla Balla Areas; 60. Stanmore Siding Area; 61. Filabusi Area.

(3) *Gwelo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

12. Somabula Siding; 13. Gwelo Station; 24. Selukwe Area; 25. Surprise Area; 26. Indiva Siding; 27. Lalapanzi; 28. Iron Mine Hill Siding; 29. Umvuma Siding; 31. Que Que Station.

(4) *Umtali.*

An area comprising the native districts of Umtali, Melsetter, Makoni and Inyanga.

No. 175 of 1912.]

[30th May, 1912.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the provisions of Government Notices Nos. 47 and 254 of 1910 (and 51 of 1911), the removal of cattle to within that portion of the prescribed areas westward of the Salt River, Tuli district, may be allowed under permit from the Chief Inspector, for the purposes of grazing and watering.

No. 213 of 1912]

[27th June, 1912.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notices Nos. 59, 70 and 105 of 1912, and, in terms of section 12, declare the following areas of infection and guard areas for the purposes of the said Ordinance.

1 NATIVE DISTRICTS OF UMZINGWANI, BULAWAYO, MATOBO AND BUBI.

(a) *Areas of Infection.*

1 That portion of Alnwick and Sauerdale lying between the Bulawayo-Mafeking railway line on the west, and the fence between the southern beacon of the farm Umganin and the northern boundary of the farm Nil Desperandum on the east.

2 The farms Adams, Emangeni, Nyorka and Ballarat, and that portion of the Essexvale Estate known as the North Paddock, which adjoins the farm Ballarat on its eastern boundary.

3 The fenced sub-division of Bulawayo Commonage which includes the township, suburbs and Hillside.

4 Induba Farm.

5 The farms Collaton, Irene and Maboqutwaneni Outspan.

(b) *Guard Areas.*

An area bounded by and including the following farms: Lochard Block, Half Ration Ranche, Chilton, Fincham's, Inyati Reserve, Huntsman, Robert Block, Induna, Waterfall, Dingaan, Rouxdale, Fundisi, Helenvale (excluding farms Nos. 1, 3 and 16), Slights, Billars, Stonycroft, Craiglee, Blewbonny, Ireland, Welcome, Paul's Rest, McGeer's Luck, Centenary Mission, Springvale, Vreigevicht, Outspan No. 3, Anglesea, Mineral King, World's View, Matopo Block, Mission Farm Brethren in Christ, Absent, that portion of the Matopos lying north of a line drawn from the south-eastern beacon of Absent to the north-western beacon of Longfield, The Range, Clarke's, Swaithes's Limerick, Pioneer's Rest, Hayhill, Rietfontein, Bradford, Hamilton, Mayfair, York, Indina, Rathline, Westondale, Sub-division A, Fochabers, Kodhwayo, Zimbile and Lochard Outspan.

2 GOROMONZI DISTRICT

(a) *Area of Infection*

Salisbury Commonage.

(b) *Guard Areas*

1 The farms Gillingham, Rainham, Stamford and Hayden.

2 The farms Avondale, Mount Pleasant and Nursery.

3 UMTALI DISTRICT

(a) *Area of Infection*

Umtali Commonage.

(b) *Guard Area*

An area bounded by and including the unsurveyed land known as Penhalonga Valley, the farms Dupris, Ferndale, Fairholme, Barrydale, from the north-western beacon of the latter along the eastern boundaries of the Premier Estate, Deepdene West and The Dairy, thence by and including the farms Wiermouth, Raheen, Fern Valley and Fernhill to the Anglo-Portuguese boundary, thence along this boundary in a northerly direction to the first-named place.

4 MELSETTER DISTRICT

(a) *Area of Infection*

The farms Tilbury, Dunstan, Sauerombi and Lindley

(b) *Guard Area.*

An area bounded by the Anglo-Portuguese border on the east, and by and including the following farms on the west: Weltevreden, Riverange, The Drift's, Cambridge, Zaaiplets, Nyaruma, Nyhodi, Bloemhof and the Ingorime Reserve No. 1.

5 MAKONI AND INYANGA DISTRICTS.

(a) *Areas of Infection*

The Makoni Reserve and the farms Makoni Kop, Lesapi Drift, Lesapi Valley, Dombo Outspan, Inyangura, Notgotimyet, Timaru, Rodel, Liverpool, York, Inyangonibe and Inyanga Valley.

(b) *Guard Area.*

An area as follows: By and including the farms Zimati Wedge, Castle Kop, Lion's Head, Outspan, Lesapi Drift, Lesapi Cave, Morkonyora, Chitora Outspan, Chimbi, Notgotimyet, from the northern beacon of the latter in a straight line to the south-west beacon of Rathcline and along its southern boundary, thence in a straight line to Mount Zewa and Bayahura, and southward along the Anglo-Portuguese frontier to the Honi River, following the southern boundary of the Inyanga native district to the Nyatanda River, thence up the Nyatanda River to the southern boundary of the Makoni Reserve, thence along the southern and western boundaries of the said reserve to the farm The Chase, thence by and including The Chase, Mboobo Vale, Mount Zanga Outspan, Inyamasanga, Manda, Zimati and Zimati Kop.

No. 233, of 1912]

[11th July, 1912.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals' Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notice No. 127 of 1910, in so far as it relates to the Protectorate of Nyasaland, and further do hereby prohibit the introduction into Southern Rhodesia of cattle from Nyasaland until further notice.

No 252 of 1912]

[1st August 1912

AFRICAN COAST FEVER. TRANSPORT AREAS.

UNDER and by virtue of the powers vested in me by the "Animals' Diseases Consolidation Ordinance, 1904," I do hereby, in terms of section 9 of the regulations published under Government Notice No 50 of 1912, declare the areas described in the subjoined schedule as areas within which the use of cattle for draught purposes may be permitted.

SCHEDULE

62 *Mazi Siding*

An area including the farms Cheronga, Highfield, Kirbyvale, Mona, Dyffryn, Maidstone, Harrisonville, Recondite and Crofton.

63 *Inyazura Siding*

An area bounded by and including the following farms: Inyamapamberi Outspan, Tiny, Marngu, Mount Zonga Commonage, Mount Zonga, Kwapassi Outspan, Orowati, Tableview, Tsungwesi Source, Tsungwesi Ridge, Everton, and the unsurveyed land lying east of a line drawn from the north-west beacon of Everton to the south-west beacon of Tiny.

64. *Igusi Siding*

An area bounded by and including the following: Winter, Spring, Eland, Buda Block No. 2, Grant, Bat'ey, Groote Schuur No. 2, Frankland, Fry's Farm, Goshen Flat, Uhlanulu, Ubusiga, Ughwindhla, Ihlobo, Woodlands, Teakdale, Barn Park, Forest Hill, Groote Schuur, Majindan, Mvuba, Barwon, Campaspe, Esperanza, Merryland and Maraposa.

65. *Gwaai Area*

An area bounded by the Malinda area, the Bechuanaland border, the Plumtree, Nyamandhlovu, Igusi, Siding, Bembesi, Shangani North and Gwelo areas, from the most northerly point of the latter down the Shangani river to the western boundary of the Shangani reserve, thence in a southerly direction along the same to the Gwampa river and down this river to the Malinda area.

No. III of 1912.]

[4th April, 1912.

ESTABLISHMENT OF POUND ON FARM CARDROSS PARK.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Bulawayo, a pound has been established on farm Cardross Park, near Fort Usher, in the district of Bulawayo, and that the said pound shall be available for the public from the 12th day of April, 1912.

No. II2 of 1912.]

[4th April, 1912.

ESTABLISHMENT OF POUND AT LALAPANZI.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Gwelo, a pound has been established on the farm Lalapanzi, in the district of Gwelo, and that the said pound shall be available for the public from the 15th day of April, 1912.

No. 165 of 1912.]

[16th May, 1912.

ESTABLISHMENT OF POUND ON FARM STONEHAM.

UNDER and by virtue of the powers vested in me by Section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Bulawayo, a pound has been established on the farm Stoneham, in the district of Bulawayo, and that the said pound shall be available for the public from the 28th day of May, 1912.

No. 203 of 1911.]

[15th June, 1911.

GAME LAW CONSOLIDATED ORDINANCE, 1906.

UNDER and by virtue of the powers conferred upon me by the "Game Law Consolidation Ordinance, 1906, I do hereby extend the provisions

of Government Notice No. 40 of 1909, as amended by Government Notices Nos. 128 and 129 of 1909, for a further period of one year from the 30th June, 1911.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartbeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 160 of 1910 withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1911, and transfers from Class

"C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Bulawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 353 of 1911.]

[16th November, 1911.

GAME LAW CONSOLIDATION ORDINANCE, 1906.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby suspend the operations of sections 9, 10 and 12 of the said Ordinance until the 30th November, 1912, in regard to game in class "B," and the following game in class "C," viz.:—Eland, koodoo, zebra and Burchell's zebra or quagga, within the following area:—

DESCRIPTION OF AREA.

An area bounded by a line drawn from the junction of the Merowa and Umfuli rivers, up the Umfuli to its junction with the Susenje, thence up the Susenje and Massome rivers to the headwaters of the latter; thence to the drift where the Sinoia-Urungwe road crosses the Inyonga river; thence northerly along this road to the Chidzurgwe hill; and thence direct to the junction of the Merowa and Umfuli rivers.

No. 201 of 1912]

[20th June 1912

GAME LAW CONSOLIDATION ORDINANCE, 1906.

UNDER and by virtue of the powers conferred upon me by the "Game Law Consolidation Ordinance, 1906," I do hereby extend the provisions of Government Notice, No. 40 of 1909, as amended by Government Notices Nos. 128 and 129 of 1909 and 203 of 1911, for a further period of one year from the 30th June, 1912.

No 243 of 1912]

[18th July, 1912

GAME LAW CONSOLIDATION ORDINANCE, 1906.

UNDER and by virtue of the powers vested in me by section 4 (2) of the "Game Law Consolidation Ordinance, 1906," I do hereby suspend the operation of the said Ordinance, in so far as it relates to the destruction of hippopotami, on the farms Impofhoe and Hippovale, in the district of Hartley, and in such portions of the rivers Serui and Umfuli as are contiguous to the said farms, for a period of one year from the 19th July, 1912

No. 110 of 1908.]

[16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel

and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
- (2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
- (4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.
- (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcasses thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.
- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—

- (1) Importation shall be through and direct from the Coast Ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
- (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed,

and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
 2. Number and Class of cattle to be imported.....
 3. Area or Farm and District where Cattle are at present located.....
 4. Area or Farm and District to which Cattle are to be moved.....
- Applicant's Signature.....
- Date
- Application
- Permit No.

ANNEXURE "B."

I,.....
 residing on the farm
 in.....do solemnly and sincerely
 declare that the..... (number in
 writing) animals also enumerated below have been in my possession since
 birth, and that lung-sickness, pleuro-pneumonia or other contagious or
 infectious disease has not existed amongst any of my cattle, nor on my farm,
 nor among any cattle with which these animals have been in contact within
 the last four years, and that these animals have never been exposed for sale
 in any public market or stock fair, nor been in contact with strange cattle,
 and that to the best of my knowledge and belief such cattle in travelling to
 Station (*i.e.*, station where cattle are to be
 trucked) will not come into contact with any animals amongst which lung-
 sickness or any other contagious or infectious disease has existed during that
 period.

Number of Animals.....Bulls.....Heifers.....
 Breed.....

Seller's Name and Address.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at.....on this.....
 day of.....before me,

Resident Magistrate for the district of

No. 211 of 1910]

[4th August, 1910.

IMPORTATION OF CATTLE FROM NORTH-WESTERN
RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

(a) the districts from which they come and through which they pass are free from contagious diseases of animals;

(b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for.

ANNEXURE "A."

Certificates under Section 3.

(a) I certify that I have examined the following cattle belonging to Mr.

.....cows and heifers,

.....calves,

.....oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....

Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr.

.....cows and heifers,

.....calves,

.....oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....

Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

IMPORTATION OF CATTLE FROM GREAT BRITAIN.

OWING to an outbreak of Foot and Mouth Disease no permits for importation of cattle from Great Britain into Southern Rhodesia will be granted until further notice.

No. 254 of 1910.]

[22nd September, 1910.

SOUTHERN BOUNDARY.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

1. All cattle within an area of twenty miles from Shashi and Ramaquabane Rivers in the native districts of Tuli-Manzamyama and Bulalima-Mangwe, save and except westwards of the south-eastern boundary of the Mphoeng's reserve, shall, within one month from date hereof, be removed therefrom by the owners to such place or places as shall have been approved by the Native Commissioners of the said native districts respectively.

2. The introduction of all cattle into the aforesaid area is prohibited.

3. Any person refusing or neglecting to remove cattle from the area, as herein provided or introducing cattle into such area, shall be liable to the penalties provided by the aforesaid Ordinance, and all cattle found in the said area in contravention of this Notice shall forthwith be destroyed.

No. 391 of 1908]

[17th December, 1908

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdraw the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

- (a) For every separate registration of a brand, 5s.
- (b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

- i. Off Neck or Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

- i. Off Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

- i. On Near Side or Ribs;
- ii. Near Rump (or Thigh);
- iii. Off Shoulder;
- iv. Off Side or Ribs;
- v. Off Rump (or Thigh).

(d) In the case of ostriches:—

- i. On Near Thigh;
- ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette."

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

No. 45 of 1909]

[13th March, 1909

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 228. of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcasses of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. (1) In the event of an outbreak of rabies occurring, the Administrator may by notice in the *Gazette* direct that all dogs within a radius of fifteen miles of such outbreak, or such other area as may be fixed, shall be kept in a safe enclosure or chained up for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash by the person exercising them.

(2) In the event of a suspected outbreak of rabies occurring, the Magistrate of a district may, and at the request of the Chief Inspector of Stock shall, direct that all dogs within a radius of fifteen miles, or such other area as may be deemed necessary, shall be kept in a safe enclosure or chained up for a period not exceeding four weeks, but may be taken out for exercise if kept on a leash or chain by the person exercising them.

(3) No dog shall be removed from any proclaimed area during such periods of quarantine.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

No. 336 of 1911]

[26th October, 1911

RABIES.

THE following instructions regarding the treatment of persons bitten by rabid animals are published for general information.

In every case where a person has been bitten by a dog or other animal known, or suspected, to be rabid the following precautions are recommended :

- (1) The wound should be immediately and thoroughly cauterized. This, if it does not altogether prevent the disease, delays its onset sufficiently for Pasteur treatment to be successfully applied.
- (2) The patient should be sent to Salisbury for treatment at once. Delays are dangerous.
- (3) The fullest information should be sent to the Health Department as to date when bitten, locality, fate of dog, and especially reasons for supposing the dog to be mad.

No. 220 of 1912.]

[4th July, 1912.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of clause II of Government Notice No. 45 of 1909 to be in force in the native districts of Victoria and Ndanga for a period of three months from the 20th July, 1912.

No. 249 of 1912.]

[25th July, 1912.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 212 of 1912, and declare the provisions of clause II of Government Notice No. 45 of 1909 to be in force in the magisterial district of Gwelo for a period of three months from date hereof.

No. 250 of 1912.]

[25th July, 1912.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904" I do hereby declare the provisions of clause II of Government Notice No. 45 of 1909 to be in force in the native districts of Chibi, Chilimanzi and Gutu for a period of three months from date of publication hereof.

[1st July, 1912.

RABIES.

SEVERAL cases have recently occurred where dogs having bitten a person or persons, were immediately destroyed and report made that they were possibly infected with rabies. In such cases it is impossible for the Veterinary Department to say in less than 18 to 20 days whether the animals were infected or not, and then only when the head of the dog concerned is received at the laboratory in a good state of preservation. Thus valuable time is lost in the treatment of persons bitten, which may lead to fatal results.

In all cases the suspected animal should, if possible, be secured by a strong collar and chain and the circumstances reported by telegram to "Veteran," Salisbury, when full instructions will be given as to the treatment and observation of the suspected animal.

No. 240 of 1910.]

[1st September, 1910.

INSECT PESTS.

UNDER and by virtue of the powers vested in me by the "Nursery Ordinance, 1909," I hereby proclaim the undermentioned insects to be pests within the meaning of the said Ordinance:—

- The Red Scale (*Chrysomphalus aurantii*)
- The Oleander Scale (*C. hederac*)
- The Circular Purple Scale (*C. aonidum*)
- Ross's Black Scale (*C. rossi*)
- The Purple or Mussel Scale (*Lepidosaphes beckii*)
- The Long Scale (*L. gloverii*)
- The White Peach Scale (*Aulacaspis pentagona*)
- Woolly Aphis or American Blight (*Schizonura lanigera*).

No. 309 of 1909]

[30th December, 1909

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from overseas, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expense of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

No. 228, of 1912]

[11th July, 1912.

IMPORTATION OF PLANTS REGULATION ORDINANCE, 1904.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that Government Notices No. 306 of 1911, and No. 35 of 1912 are hereby repealed, and section 17 of the regulations published under Government Notice No. 141 of 1906 is hereby repealed and the following regulation substituted in lieu thereof:—

"17. The introduction into Southern Rhodesia of any plant, not being seed, fruit, bulb, tuber, cut flower, vegetable or vegetable transplant originating in the Union of South Africa, not grown in a nursery registered at the Department of Agriculture, Pretoria, under the 'Agricultural Pests Act, 1911,' is prohibited, except under special permission from the Director of Agriculture, Salisbury, Southern Rhodesia, who may impose such conditions in regard to such importation as he may think fit."

No. 249 of 1908]

[27th August, 1908

PROTECTION OF TREES.

[T is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act, 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

Department of Posts and Telegraphs,

Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

[T is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.

Postal Notice No. 32, of 1912.

RURAL TELEPHONES.

IT is hereby notified for public information that the Government proposes to materially extend telephonic communication in rural districts throughout Southern Rhodesia so soon as the necessary material can be obtained, and is prepared to consider applications from groups of farmers and others who desire such communication.

Under the proposed scheme telephone lines will be erected from the nearest convenient telephone exchange or telegraph office to a centrally situated farm or place of business, and provided the parties interested undertake to attend to the telephone and transmit telegrams for the public at the tariff in force no rental will be charged for such lines. Suitable accommodation for securing the secrecy of telegrams and telephone conversations must be provided free of charge to the satisfaction of the Postmaster General. The person selected to take charge of a central telephone office for the use of the public, will be required to pay over to the Postmaster General's Department monthly the revenue collected for telegrams and telephonic conversations and to render such simple accounts as may be required in connection therewith.

Branch lines from the selected centres to individual farms, business premises, etc. will be charged at the rental tariff in force, £6 6s. per mile per annum for farms and private residences, and £10 10s. per mile per annum for business premises. These charges are regarded to be as low as is at present feasible. Applications should be made through the Postmaster General.

G. H. EYRE,
Postmaster General.

General Post Office,
Salisbury, 16th July, 1912.

RATES FOR RHODESIA GROWN TOBACCO (UNMANUFACTURED.)

THE Beira and Mashonaland and Rhodesia Railways announce that with effect from 1st November, 1912. Rhodesia-grown tobacco (unmanufactured) consigned at owner's risk will be conveyed between all stations, Beira to Broken Hill and Vryburg, including branches, at third class rate, subject to a maximum charge of £2 1s. 8d. per ton, or ¼d. per lb., minimum charge as for 50lbs.; no lower charge than 1s. per consignment. Tariff Book No. 5, clause 63, page 83, is modified accordingly.

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